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Spokane, Wash.	
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Civic center	May, 85
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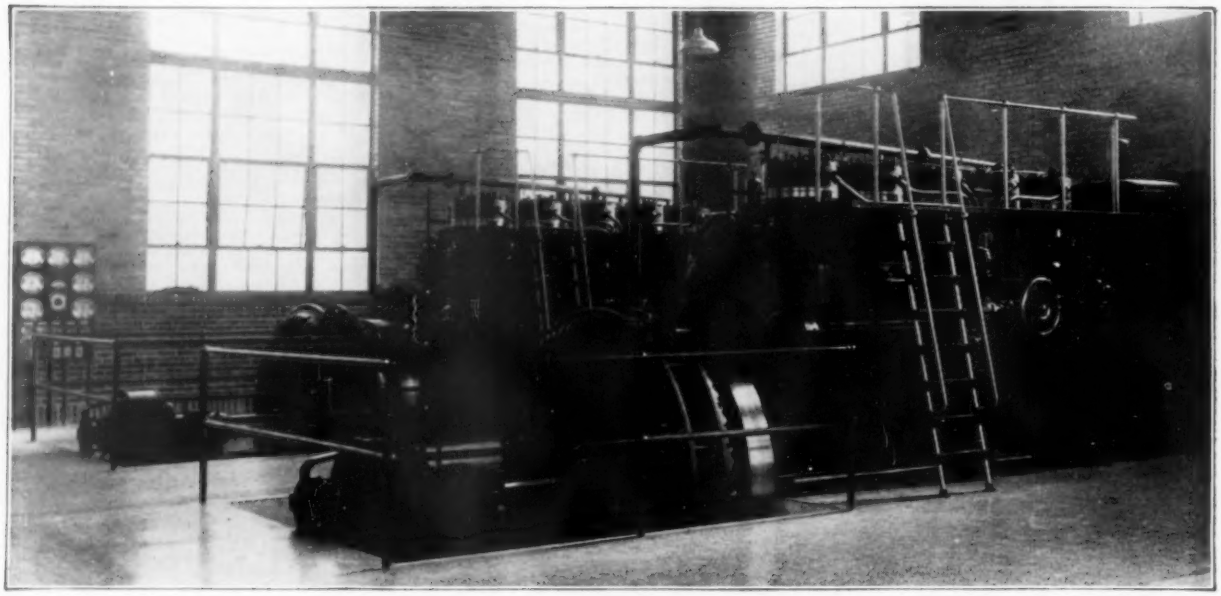
In THE MUNICIPAL INDEX AND ATLAS (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find statistical material, and articles on a wide variety of municipal and public works subjects, not published in the monthly issues of the magazine.

See pages 19, 20, 21, 79, 81 for notices of catalogs and publications on municipal and civic subjects

For Index to Advertisements see page 106

Paris, Kentucky, proves wisdom of change to F-M DIESELS



Makes $15,000.00 profit in first six months . . .

Paris, Kentucky, (6,000 population) made the decision to produce its own electric power and light. The decision, of course, met with opposition. The usual arguments for a private source of power as opposed to municipal ownership were set forth and successfully overcome. A municipal plant with two F-M Diesel generating units was accordingly installed. So quickly did consumers rally to the municipally produced power, however, that a third unit was soon required and installed.

The operating statement of the municipal plant for its first six months proves the wisdom of the choice Paris made!

$15,000.00 operating profit! $15,000.00 that remained in the city and swelled the city's assets.

In its municipal power plant, this city is building a permanent and profitable asset and source of revenue. The ability of F-M Diesels to produce power *cheaply* and dependably makes it possible for cities everywhere, large and small, to brighten their financial outlook.

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DIESEL ENGINES

6231—OA98.101

Public Works–Relief–Housing

More Liberal PWA Grants and Improved Federal-City Relations Urged

LIBERALIZING of Federal allocations to local governments was strongly urged in a statement of the International City Managers' Association released December 10 by Clarence E. Ridley, Executive Director of the Association. The statement also advocated that steps be taken to improve Federal-city relations on relief, public works and housing. The recommendations regarding public works follow:

"1. That there be but one Federal Public Works agency with which cities are required to deal in all public works matters.

"2. That there be a reorganization of this agency in which administration would be decentralized by dividing the country into regions and delegating broad authority in each region to a civilian deputy who has had experience in directing public works projects. All functions of law, finance, engineering, auditing, and inspection should be localized in each region.

"3. That responsibility for direct supervision and inspection of work be given to the local unit of government, subject to the regional administrator's right to designate a Federal supervising engineer when he may deem necessary.

"4. That a committee of local government officials be appointed to consult with PWA authorities with a view of expediting projects by consolidating and simplifying present regulations.

"5. That payments for work done under contract between cities and the Federal Government be expedited. Contractors are being held up in their payments by unnecessary delays.

"6. That wages paid under PWA be adjusted more nearly to prevailing wages in particular localities in preference to the present arbitrary rate on the basis of three zones for the entire nation.

Allocations

"7. That allocations to local governments be liberalized and made more just and adequate by adoption of the following provisions:

"a. Total Federal public works money available for non-Federal projects should not be less than $2,000,000,000, and the Federal grants for local projects should be increased to 50 per cent of the total cost.

"b. All Federal money now allotted to Federal projects which are not to be commenced within one year should be withdrawn and allotted to non-Federal projects.

"c. The appropriation for non-Federal projects should be allocated to the several regions on the basis of need, with as much consideration as possible to population and by them to the states on the same basis. There should be a time limit on the use of any allocation by a state or a region at the conclusion of which it shall revert to the region or Federal Government or re-allocation to a unit whose original allocation has been used and where further requests are being made.

"8. That cities be extended the benefit of the interest rates available to the Federal Government."

Relief

The Association's recommendations as to relief are, in brief:

"1. That the Federal Government establish as soon as possible a Federal Department of Public Welfare to replace the temporary emergency organization.

"2. That this Federal welfare agency adopt and announce a long-time relief program, so that local governments may make adequate plans for at least two years.

"3. That more attention be given to the area of administration, so as to include a territory large enough to secure effective management of relief and welfare, with centralized responsibility but decentralized administration.

"4. That the work program be expanded and that wage rates for work projects be no higher than prevailing wages for similar work in the particular locality."

Housing

The Association's suggestions for housing are:

"1. That the FERA encourage a wider use of white-collar workers on housing, traffic and other surveys to determine all relevant facts on housing conditions.

"2. That the Housing Division of PWA encourage local units to create housing authorities to cooperate with the Federal Government and to assume responsibility for developing programs for improving housing.

"3. That the housing division of PWA, in cooperation with city officials, develop a definite long-time program for improving housing conditions."

More Spacious Zoning Advocated by FHA

ENDORSING the trend in modern housing developments towards lower land coverage in single- and multiple-family dwellings, the Federal Housing Administration, in its Circular No. 2 on "Property Standard," issued November 27, 1934, advocates "a lower maximum of lot coverage than is frequently the maximum permitted by local ordinances."

In outlining requirements for mortgage insurance under Title II of the National Housing Act, the circular says in part:

"Provisions for light and air which are inadequate according to enlightened practice are increasingly a factor in obsolescence and will give a mortgage a low rating as an insurance risk.

"A desirable maximum coverage for single-family detached houses, including all accessory buildings, is approximately 20 per cent of the lot, exclusive of any area given to streets, alleys, or easements. In no case shall the coverage of a lot for this type of property exceed 30 per cent for an interior lot or 40 per cent for a corner lot. These latter coverages are acceptable standards for attached houses and for two- to four-family buildings, but may be exceeded in cases of such attached or two- to four-family buildings where it can be demonstrated that an adequate provision of light and air is available to all inhabited rooms.

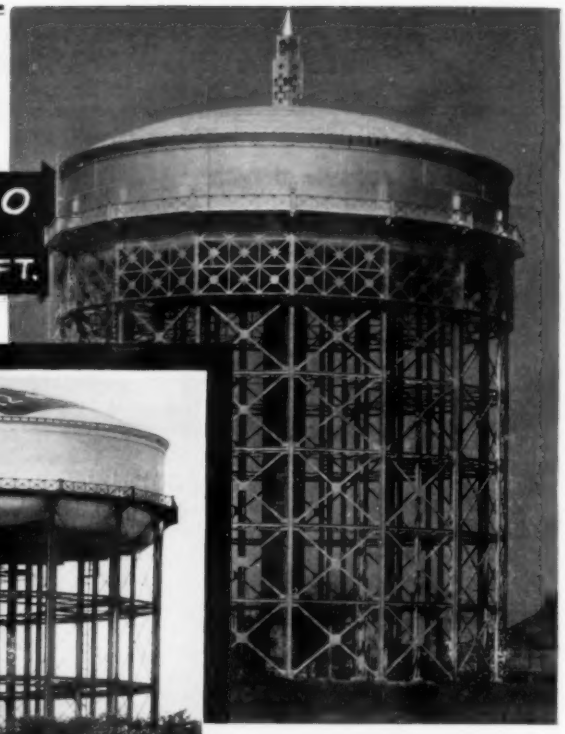
"The property shall have adequate and immediate access to a public street or road or permanent easement which shall be of width and construction suitable to the vehicular traffic requirements of the neighborhood in which the property is located. Pavements which add cost out of relation to the need of the neighborhood will be looked upon with disfavor. On the other hand, a property having access only by an unsurfaced way shall be ineligible."

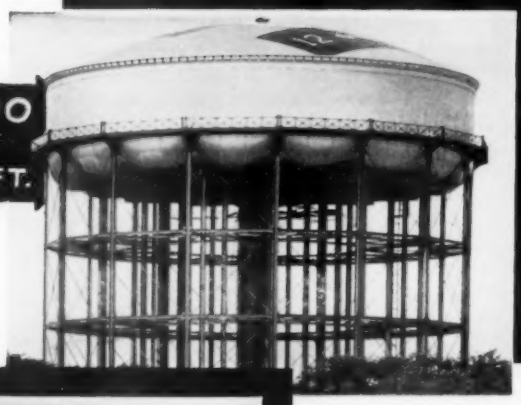
Discussing minimum neighborhood requirements, the circular says:

"The neighborhood should be of a homogeneous character and should offer security against decline in desirability due to the encroachment of inharmonious land uses. A property will be found ineligible if one or more of the following situations introduces an *unquestionable major hazard*: the absence of, or inappropriately drawn, zoning or private restrictions; the presence of, or the imminent danger of the intrusion of, buildings or land uses detrimental to the property in question, such as business or industrial establishments, smoke, odor, noise, unsightly features, etc."

What War Costs Might Do for Public Works
is graphically shown in a Chicago Daily Tribune cartoon, reproduced on page 71.

BIG TANKS with . . . .





. . . LITTLE Pressure Variations

Elevated storage tanks for municipal water systems have shown two outstanding trends—(1) to large size, and (2) to shallow depth. Horton tanks combine these features. Typical examples of the depth of some large tanks are illustrated here.

We will be glad to send you performance data on large elevated tanks in service, also estimating figures for determining the operating economies of shallow-depth tanks in your waterworks system.

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Cleveland	2236 Rockefeller Bldg.	San Francisco	1033 Rialto Bldg.
Detroit	1501 Lafayette Bldg.	Houston	2919 Main Street
Philadelphia	1616 "1700" Walnut Street Bldg.	Tulsa	1625 Thompson Bldg.
Boston	1501 Consolidated Gas Bldg.	Los Angeles	1403 Wm. Fox Bldg.

Fabricating plants in CHICAGO, BIRMINGHAM, and GREENVILLE, PA.

Water Supply and Purification

The Water Supply of Council Bluffs, Iowa

THE population of Council Bluffs is 43,000. The original water plant was built in 1881 and 1882 under the ownership of the Council Bluffs Water Works Co. On June 1, 1911, the city of Council Bluffs took over the plant, which is now operated by the Board of Water Works Trustees. The Missouri River is the source of supply, and all water is treated by sedimentation, coagulation, secondary sedimentation, and activated carbon, and sterilized with ammonium sulphate, liquid chlorine, anhydrous ammonia and a final treatment of liquid chlorine.

There are seven sedimentation reservoirs, with a total capacity of 18,522,000 gallons. The three clear-water reservoirs have a total capacity of 11,894,000 gallons. A high-level reserve reservoir at an elevation of 239.5 feet has a capacity of 4,288,570 gallons, and there are two elevated tanks on the distribution system at elevation 400, with a capacity of 275,000 gallons.

There are two 13 mgd electrically driven low-service centrifugal pumps and one 10 mgd gasoline-driven centrifugal unit on the same service as a standby. On the high service, there are two 8 mgd and one 4 mgd electric-driven unit and two 8 mgd steam-driven units. For the high-service section there are one 750 gpm gasoline-driven, one 600 gpm and three 350 gpm electric-driven centrifugal pumps. The average daily pumpage in 1933 was 3,759,099 gallons, giving a per capita consumption of 87.4 gallons.

There are 112.37 miles of cast iron mains, ranging from 4 inches to 30 inches in diameter, to which are attached 944 fire hydrants. The water is controlled by 1,122 main valves 4 inches and larger, and there are 880 hydrant valves. There are 10,551 metered services and 10,551 active meters.

WILLIAM T. BAILEY,
Chemist, Council Bluffs Water Works.

The Public Water Supply of Santa Fe, New Mexico

THE watershed of the Santa Fe supply consists of 2,000 square miles in a natural forest owned by the United States Government. This area was closed to grazing and recreation in 1932, the action improving the purity of the water, and no treatment was considered necessary, not even sterilization. This is a gravity system with two impounding reservoirs, 7 miles and 3 miles from the city, with a capacity of 175,000,000 and 135,000,000 gallons respectively.

A 6,000,000-gallon settling basin is located just below the first reservoir, which was built in 1898. The settling basin collects the excess silt and provides sufficient time for adequate subsidence. In 1922 and 1923 it became necessary to provide for more storage, owing to a bad drought.

The distribution system consists of 30 miles of pipe divided into three sections. The south side is fed by the lower reservoir, the central side fed by the settling basin, and the north side fed by a pump from the lower reservoir and storage tank. Since 1912 all replacements of pipe in the distribution system have been with cast iron. Experience shows the necessity of burying all surface and distribution pipes 4 feet below the ground surface in Santa Fe in order to be below the frost line.

A flate rate was charged for water in 1927, 1928 and 1929. Since that time the system has been 100 per cent metered in order to stop waste. In 1923 the maximum consumption was ½-million gallons per day; in 1934, the consumption is 2½ million gallons per day. Mean consumption is 175 gallons per person per day. The pressure maintained is 70 pounds, and the average meter rate is 11 cents per 1,000 gallons.

O. B. SUMMERS,
Manager, New Mexico Power Co., Santa Fe, N. Mex.

Tracing the Underground Flow of Water

A SURPRISING number of people actually believe in the ability of Rhabdomancers, commonly called "water witches," and considerable evidence was presented at a recent convention of this cult at Vienna to prove that electric currents are responsible for this phenomenon, but several pertinent features such as the voltage necessary to bridge the gap between the twig and the ground were not explained.

Since the majority of water supplies are derived from underground sources, the movement of underground waters is important from a replenishing standpoint, and the transportation of pollution. The vulnerable points where pollution may enter are: unprotected well tops; leaky well casings; suction reservoirs or other works at elevations which permit entrance of surface pollution or ground water; those works built on sites subject to flood; existence of abandoned wells or bore holes, which give polluted water access to the stratum from which the supply is taken; existence of broken sewers or drains in the vicinity of supply works; and cross-connection with an unsafe supply.

Three general methods of tracing underground flows have been developed and used with varying degrees of success. They are: the chemical method; the electrolytic method; and the use of dyes. The chemical method consists of dosing the upper well with some readily soluble and easily tested chemicals and making analyses of samples taken at regular and frequent intervals from the lower well.

The electrolytic method is very similar, except that the change of voltage is measured and sal ammoniac (ammonium chloride) is used for an electrolyte.

Numerous coal tar dyes have been used in the third method; the most common dye is fluorescein. Fluorescein can be detected in dilutions as great as one part in ten million.

In order to trace the travel of seepage from sewage disposal plants, sewers, etc., the method for testing free ammonia and nitrites has also been used. High free ammonia and nitrites content have shown that sewage has been known to travel 1,500 feet through fine sand. Numerous instances where the above methods have been successful in tracing pollution entering public water supplies are known. B. Prodigiosis has been used in testing the flow from a source of pollution, since it is not a pathogenic bacterium and is not normally present in sewage or in well-water supplies. The only thing against its use is the laboratory equipment required.

F. M. VEATCH,
Consulting Engineer, Kansas City, Mo.

The Water Works of Lincoln, Nebraska

PRIOR to 1932, the water supply of Lincoln was obtained from 28 wells located within the city limits, each having a capacity of approximately one-half million gallons per day. In 1932 an additional supply was developed in the Platte River Valley near Ashland, Nebr. At this location five wells were constructed, 2,000 feet apart, each having a capacity of 2½ million gallons per day. These wells are pumped directly into a 36-inch pipe line which discharges into a 3-million-gallon reservoir located approximately 2½ miles from the nearest well. At this reservoir is located a pumping station with one 6 mgd and one 9 mgd centrifugal pumping unit which deliver into a 36-inch cast iron pipe line 25 miles long to Lincoln.

At the Lincoln end are located a group of suction reservoirs, totaling 34 million gallons capacity. There are four pumping stations in Lincoln which furnish pressure for the various parts of the city. The A Street station is the chief pumping station and is a combined water and light plant. This station contains one DeLaval steam-turbine-driven, high- and low-pressure pumping unit of 11.5 mgd capacity at 60 pounds and 5 mgd at 90 pounds; one Allis-Chalmers 8 mgd centrifugal at 60 pounds pressure; one Dayton-Dowd 3 mgd capacity centrifugal pump at 90 pounds; one Fairbanks-Morse 3 mgd centrifugal at 90 pounds; one Snow steam pumping engine at 6 mgd capacity at 60 to 90 pounds. There are 250 miles of mains in the distribution system.

D. L. ERICKSON,
City Engineer, Lincoln, Nebr.

PULLING JACK FROST'S TEETH!

"To reduce the danger of freezing, I recommended 'Incor'. . ."

Quick-Hardening Concrete Safe from Freezing 2 to 5 days Sooner . . . Heat-Curing Costs 60% to 70% Lower

The quicker concrete hardens the sooner it is past the danger of freezing and the lower the cost of maintaining heat-protection. Because 'Incor' is a better, more thoroughly processed cement, it cures or hardens 5 times as fast as ordinary Portland cement. That is why 'Incor' concrete is safe from freezing 2 to 5 days sooner. Heat-protection costs are 60 to 70 per cent lower. Other savings include earlier form re-use—one form set does the work of several.

It pays to Switch to 'Incor'

Why not figure these savings. It has paid many contractors to switch to 'Incor' with the coming of Winter. Example: In constructing the Administration Building and Hangar for the 26th Div. Massachusetts National Guard, shown above, the engineer says:

"January temperatures were below freezing and building site very much exposed. To reduce danger of freezing, I recommended that the contractor use 'Incor' Cement. Materials were heated and salamanders used after concrete was poured. 72 hours' protection requirement was reduced to 36 hours. Earlier removal of forms saved much lumber; but the real reason for using 'Incor' was to reduce freezing hazards."

Write for New "Winter" Book

Write for free copy of new illustrated booklet, "Winter Construction." It is full of helpful and timely information. Address 'Incor' 24-Hour Cement, Room 2200, 342 Madison Avenue, New York. 'Incor'* is made and sold by producers of Lone Star Cement, subsidiaries of International Cement Corporation, New York; also sold by other leading cement manufacturers.

* Reg. U. S. Pat. Off.

'INCOR' 24-Hour Cement

When you write for that catalog mention THE AMERICAN CITY

Relief Work, Snow Removal, Street Maintenance

Too Much Paternalism?

THOSE relief workers in Ithaca, N. Y., who called a strike on seven work projects may have really believed that they were being badly treated. The town had been paying them $12 to work 24 hours a week. It had asked them to work 30 hours for the same pay. The workers seemed to regard this as harsh treatment, exploitation or perhaps something worse, depending on the individual temperament of the men. The New York *Sun* summarizes this condition most effectively, saying: "If those relief workers were among the unemployed three or four years ago, in the early stages of the depression, and their city had hired them in a 24-hour week for $12, would they have gone on strike if their time had been increased 6 hours? The present incident illustrates a change that has occurred in the attitude of men who owe their livelihood at this time to public funds. As government, whether it be city, state or Federal, has increased its solicitude for the welfare of the jobless and has elaborated its system of caring for those dependent on such aid, a certain type of worker has grown more rebellious and sensitive toward real or fancied bruising at the hands of paternalism."

20,000 Snow Shovelers to Be Hired in New York City

HOME relief families are to be favored in the choice of the 20,000 snow shovelers to be hired by New York City this winter to augment the snow-removal forces of the Department of Sanitation, according to a report of Commissioner of Public Welfare William Hodson. Thus these men will receive regular wages in lieu of relief.

"This arrangement, which will give some employment to 20,000 men," Commissioner Hodson said, "is in line with the general policy of the city relief administration to get people who are now receiving relief back to normal employment as fast as it is possible to do this. This policy is impelled not only by the desire to reduce the community's relief costs as rapidly as improvement in the employment situation permits, but also by the conviction that the unemployed need employment as much for the preservation of their working ability and general morale as for the material needs their wages will provide.

"The Home Relief Bureau began on November 7 to register 23,000 men for this purpose. Members of families who have been longest on relief will get first chance, and only men who are really physically fit for such work will be accepted. Those who are chosen will be notified by their home relief investigators to report at a stated time at relief precinct offices."

Miami Streets

THE Division of Streets of the Department of Public Service in Miami is charged specifically with the maintenance of all streets, sidewalks, curbs, gutters, driveways and alleys, including all bridges not spanning the Miami River. The street mileage is approximately as follows:

Asphaltic types	108.53 miles
Concrete	14.02 "
Oil macadam	374.66 "
White rock, all types	128.70 "
Unsurfaced	75.69 "
	701.60 miles

During the fiscal year ending June 30, 1934, 56,900 square yards of asphaltic streets were resurfaced with sheet asphalt manufactured in the city plant; 14.02 miles of concrete streets were maintained; 66.89 miles of white rock streets were patched; 8,792 square feet of utility ditches were repaved; 30,162 square feet of broken sidewalks were rebuilt; 5,642 linear feet of broken curb were rebuilt; 1,016 linear feet of broken curb and gutter were rebuilt; 2,642 linear feet of broken gutter were rebuilt; 5,733 square feet of broken driveways were rebuilt; 2,381 miles of oiled macadam streets were patrolled and patched about six times during the year; the old wooden bulkheads and pilings were removed from the N. E. 79th Street bridge and replaced with solid concrete abutments; a considerable portion of the substructure of the bridge across the Tamiami Canal at West Flagler Street was rebuilt and entirely refloored; and 148,900 square yards of worn-out white rock and old oiled streets were rebuilt and oiled, this being the equivalent of about 17 miles of streets 15 feet wide.

Since 1928 the funds available for maintenance per mile of street has been less than one-quarter of what it was from 1922 to 1925, and even this does not tell the entire story. Before the annexation of large territory in 1925 a large proportion of the existing pavement was comparatively new, of permanent nature, and had not yet been badly cut up by the installation of underground utilities which took place during the boom period.

In the 33½ square miles of area annexed in September, 1925, there were more than 200 miles of oiled streets, 250 miles of white rock streets, and 175 miles of unsurfaced streets, most of it opened and built by subdivision promoters and of such character as would last at least long enough to sell the property. The white rock surfaces are impossible to maintain properly under much traffic. They are dusty in dry weather and sloppy in wet weather. The oiled surface streets, especially of the character inherited in the annexation, are not intended for heavy duty or long life, and even if well built must be re-oiled every four or five years for proper maintenance. Little or no re-oiling has been possible until this year, when the city of Miami received labor assistance from CWA. Because re-oiling has been neglected, a very large mileage of streets has deteriorated to the point where rebuilding is necessary. To keep up re-oiling alone would require $75,000 a year, but with this work so far behind now, it would require much more than that for several years to catch up to the point where regular maintenance oiling would prevail. In the long run, it is much cheaper to re-oil when needed than to permit the surface to go to pieces and then rebuild the entire pavement and oil it new.

If $445 per mile of street was proper for street maintenance twelve years ago, in 1922-23, with a considerable proportion of permanent type surface, then at least as much per mile should be justified now when the same streets are twelve years older, when there is increased mileage of cheaper type pavement requiring more intensive maintenance, when traffic is much heavier, and when maintenance is more difficult. So, for the present 701 miles of street, the appropriation for street repairs, using the pre-boom basis of $445 per mile of street, should be at least $311,945 per year instead of $114 per mile, or $80,355, as in 1933-34.

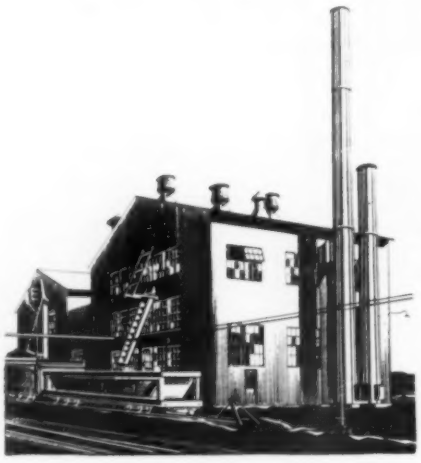
After five years of inadequate maintenance, the streets, sidewalks, curbs and gutters have so deteriorated that $250,000 per year for five years would be required to get them back into satisfactory condition for proper maintenance. This amount should be continued for another five-year period at least, to carry on maintenance, and gradually replace the cheaper type pavement by a higher grade pavement where traffic conditions warrant.

Miami is not the only city that faces the need of greater immediate attention to its maintenance problems. Probably 90 per cent of the cities in this country are in exactly the same position as regards existing streets, in spite of the fact that they have not suffered from large annexation of territory largely developed for speculation.

The construction materials used during the last fiscal year were:

Asphaltic cold patch material:		
Sheet type	2,917 tons	
Asphaltic concrete type	432 "	3,349 tons
Pit rock		21,617 cu. yds.
Canal bank fill		1,822 " "
Sand for asphaltic cold patch		2,746 " "
Sand for concrete		895 " "
Sand for oiling and sanding		11,245 " "
Rock for concrete		742 " "
Cement		6,074 sacks
Liquid asphalt for patch material		25,466 gals.
Asphalt for oiling streets		165,450 "
Solid asphalt		73 tons

WILLIAM SYDOW,
Director, Department of Public Service, in a report to the City Manager of Miami, Fla.



INCINERATION

Ends the Sewage Disposal Problem

COMBUSTION ENGINEERING COMPANY · INC
200 MADISON AVENUE · · NEW YORK, N. Y.

A PUBLICATION OF TIMELY INTEREST

NEW BOOKLET NOW READY DESCRIBING THE C-E RAYMOND SYSTEM OF *Sewage Sludge Incineration*

A copy of this booklet will be sent promptly on request.

The C-E Raymond System of Sewage Sludge Incineration is odorless, easily operated and extremely economical. It costs less to install than other methods of complete disposal and has none of their objectionable features.

Incineration is the coming practice and the C-E Raymond System is its most advanced development. Write for booklet "Incineration Ends the Sewage Problem."

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MANUFACTURING DIVISIONS: The Hedges-Walsh-Weidner Company, Chattanooga, Tenn.; Heine Boiler Company, St. Louis, Mo.; Coshocton Iron Company, Monongahela, Pa.; Raymond Brothers Impact Pulverizer Company, Chicago, Ill.

C-E PRODUCTS: Pressure Vessels, Fabricated Plate Work, All Types of Pulverized Fuel Systems, Mechanical Stokers, Boilers, Complete Steam Generating Units, Water Cooled Furnaces, Economizers and Air Heaters.

Why not remember to mention THE AMERICAN CITY?

Sewerage and Sewage Disposal

Sewage Treatment Plant Construction on the Increase

OWING to the economic conditions prevailing during the past year, there was but a relatively small volume of sewage treatment plant construction. Within recent months, however, there has been a decided impetus to new construction of this type growing out of the Public Works Administration allotments. Nearly 700 cities have received allotments of funds from the PWA for sewerage or sewage treatment, involving an aggregate expenditure of well over $200,000,000. The largest single allotment was that of $42,000,000 to the Chicago Sanitary District, approximately one-half of which is to be expended for contracts previously let but closed down because of inability to finance, and the remainder for entirely new work along the lines of a program laid down by an engineering commission employed by Secretary Ickes. Construction contracts have been let on many of the PWA projects, and work is now actively under way. Only in a very few isolated instances did cities proceed with sewage treatment plant construction in the past year without Government aid in financing.

—From a paper presented by L. R. Howson, of Alvord, Burdick & Howson, engineers, Chicago, Ill., before the International Association of Public Works Officials.

False Economy Causes Flood of Sewage in Cairo Streets

ABNORMAL infiltration of ground water in the city sewage system of Cairo, Egypt, in September, caused a breakdown of the power plant of the main drainage pumping system. The infiltration was due to an abnormal high flood in the Nile and caused an overflow of sewage into two streets. The main overflows occurred in the leading residential quarter for English and American nationals.

City employees worked night and day to repair the gasoline engines and pumps and to clear the streets. New parts for the damaged engines had to be ordered from London. In order to lessen the flow of sewage, the water supply was curtailed and water was obtainable in three periods of only two hours each daily. Pumping engines were rushed from Assuan Dam while city fire engines were being used to clear the streets.

According to a report in *The New York Times*, Cairo has grown enormously in recent years and the drainage system has failed to keep pace. Repeated requests to the government for credits to purchase spare parts and additional machinery have been invariably refused on the plea of economy. This breakdown was the result of too great economy.

Revolving Distributors for Trickling Filters

PRIOR to 1900, several forms of trickling filters using various materials for the filter medium had been employed, with splash plates for distributing the sewage to the bed, as well as various forms of spray nozzles, troughs, etc. English investigators were not satisfied with these, and in 1894 Corbett experimented with a unit with revolving arms. Nothing further was done with this until about 1898, when the first full-scale installation was made, at Reigate, England, with a unit designed by Caink and manufactured by Candy. This unit consisted of a central column connected to the inlet pipe, and provided with two or more arms with holes through which the sewage jetted, imparting a rotary motion to the arms. All the rotary distributors developed since have employed the same principle, which provides for uniform distribution of the sewage over the bed surface. One variation was a unit driven by means of a 5-hp oil engine, which was built and installed at Birmingham, England, about 1900. Owing to the absence of operating cost of the jet-propelled type, however, the motor-driven type has never taken hold, except in cases of rectangular beds where the jet principle was not applicable.

These revolving distributors gained rapidly in favor in England, but were not installed in America until much later, owing primarily to the fear that they would freeze in winter. The first recorded installation in this country was at Pontiac, Mich., about 1920. About 1912 a traveling unit was installed for rectangular beds at Springfield, Mo. Several installations were made in Canada, notably at Toronto and Whitby, and were covered over to protect them against the extreme cold. Within the last three years there has been a revival of interest in these units, and a number of installations have been made for municipal, institutional and industrial plants.

The general advantages of the revolving distributor have always been present, but the factors of economy of this unit seem to have been entirely neglected or overlooked for nearly two decades. The revolving type of distributor essentially requires the construction of a circular bed, but in small plants this is no objection, and in the larger plants the beds may be nested so that the minimum area is unused between them. The salient features of this type of distribution are:

1. It avoids pumping of sewage where the head is insufficient for the fixed nozzle type of bed, which requires about 12 feet total head. The revolving type operates on a total head of less than 2 feet from high water in the dosing tank to the top of the stone in the filter bed.

2. Effect of wind is minimized. This also nullifies the disturbing effect of the wind.

3. One inlet pipe only is needed to bring the sewage to the central distributing column from which the arms take it.

4. The unit is more flexible to variation in flow. As the head in the dosing tank increases owing to increased flows, the unit will run slightly faster to accommodate itself to the extra impetus given by the jets, or will run longer to carry off the accumulation, but does not overdose any given area as in the case of the fixed nozzle type, which at its maximum spread of spray applies sewage mainly to the perimeter of the spray zone for a longer period and overdoses that area.

5. Less chance of dissemination of odors through the surrounding atmosphere, since the spray is directed downward toward the stone and not sprayed up into the air where air currents can catch it.

—From a paper on the mechanization of sewage treatment, presented by Edmund B. Besselievre, Sanitary Engineer, The Dorr Co., Inc., New York, before a joint session, Public Health Engineering Section, American Public Health Association, and Central States Sewage Works Association.

The Filtration and Incineration of Sewage Sludge

TESTS carried out in various parts of the country indicate that vacuum filtration of sludge, either fresh, activated or digested, is practical and economical for sizable plants. This process can be confined to a small space, whereas with air drying on sand beds large areas of land are needed, which may be expensive and difficult to obtain. Filtration eliminates a great deal of labor or expensive equipment for sludge removal. In the case of filtration of fresh solids the cost of digestion tanks is eliminated. This method removes the possibility of offensive odors which may occur during the air drying of only partially digested sludge, a process which may be necessary from time to time. Dewatering in this way is entirely independent of weather conditions, and the whole process is continuous. In the North, sludge drying on sand beds is unsatisfactory during three or four months of the year, and storage tanks or glass-covered beds must be provided. If storage tanks or glass-covered beds are not included, the cost of vacuum filtration and of drying on sand beds is about the same, the cost of filtration being estimated at $5.00 per ton, and of drying on sand beds, $4.49 per ton. If storage tanks or glass-covered beds are used, the cost of air drying is higher.

Incineration seems to offer a satisfactory method for the final disposal of sludge, especially in the case of fresh or activated sludge where odor trouble with the filtered cake may be encountered.

—From a paper by Prof. G. P. Edwards, Department of Sanitary and Municipal Engineering, University of North Carolina, presented before the North Carolina Sewage Works Association.

Be Modern With Marion and Save Money

"Being modern with Marion" means not only using a modern-type *enclosed* truck body for all garbage collections; it means using the modern *compression-type* body, manufactured exclusively by Marion—one in which a simple device compresses the load, squeezing out the fluid content into a 110-gallon container located below the body.

This results in *substantial savings in garbage collection costs* because of the greatly increased capacity of the truck body: *The capacity of the Marion Refuse Compressor is 6 cubic yards, compressed, which is equal to 12 to 15 cubic yards of loose refuse.*

Mr. M. B. Cain, Superintendent of Street Cleaning and Refuse Collection in Columbus, Ohio (one of the cities that has already gone modern with Marion), writes: "I am well satisfied with the results we are having with the compression type body. It has two distinct points in its favor: First—It is enclosed, eliminating unsightly conditions while passing through the streets. Second—It is the lowest-priced enclosed body that I know of on the market; simple in its operation and proving a substantial saving in garbage collections."

(Mounted on any 1½, 2 or 2½-ton truck)

Write for Circular

Manufactured Exclusively by

The Marion Steel Body Company, Marion, Ohio

Patents applied for

Street Cleaning and Refuse Disposal

How Much for Refuse Disposal? Cities Don't Know

AMERICAN cities, on the whole, may be clean housekeepers, but they don't know how much it is costing them to be clean or whether they are spending too much. Only a few cities are able to report accurately the unit cost of removing garbage and other refuse and of cleaning streets, according to the Public Administration Service, of Chicago, Ill., which further reports that at least 90 per cent of the cities in this country have no cost control over this service. As an example of how the wrong impression of costs can be given by incomplete figures, the Service cites a city listing its service cost for collecting a ton of garbage at $1.43. Under "service costs," however, are listed as contributing factors only "direct labor costs" and "costs of materials and supplies." Overhead and cost of use of equipment are omitted, so that the reported expense of this municipal service is probably really much higher.

Records for cost of street cleaning service are also inadequate. Only twenty cities out of more than a hundred which replied to the annual report form of the Public Administration Service indicate that they have any idea of unit costs of street cleaning. Except for the gross expenditure figures, information is lacking on street maintenance, sewer work and other public works operations.

Need for lowering the cost of the increased amount of services that must be given has awakened city officials to the practical uses of improved public works administrative procedures and uniform cost accounting and records systems. Cost accounting procedures that enable a close check on expenses, including operation, maintenance and depreciation on equipment, are a real aid to this end. During the past year complete installations of uniform cost accounting have been made by the Public Administration Service in the cities of Niagara Falls, N. Y., Shorewood, Wis., Springfield and Worcester, Mass., and Arlington County, Va.

Department of Sanitation Reorganized

THE Department of Sanitation of New York City has been completely reorganized during the past year. The Department as now functioning has two operating divisions — engineering, and street cleaning and waste collection; and three administrative divisions—administration, trials and legal affairs, finance and supplies, each under a deputy commissioner; and an inspection division under the Assistant to the Commissioner.

A report prepared by Colonel Thomas W. Hammond, Commissioner, covering the operation of the Department from March to September, 1934, indicates the changes made in the Department under the new administration, emphasizes the spirit among the personnel of 14,000 employees; discusses plans for the future, including contracts to be let for the construction of additional incinerators, and for sewage treatment works now in process of construction; and outlines recent accomplishments. It is interesting to note that this report of the Commissioner was read to the entire personnel of the Department when assembled for that purpose on September 25. This indicates a desire by the Commissioner for a real esprit de corps.

Street Cleaning Summer and Winter in Akron, Ohio

ONE of the least observed activities in the Service Department in Akron is the work performed by the Division of Street Cleaning. Except in the winter months when the men are seen shoveling snow and making streets less dangerous by applying salt, cinders, etc., little is known of their activities. They are working in the early hours of the morning, so far as street sweeping is concerned, when street parking of automobiles is at a minimum. All motor sweepers are back in the garage by 9 A. M. with their day's work finished.

The Division of Street Cleaning is wholly supported by special assessments. Periodically, at every tax-paying period, complaints are made concerning this assessment. "Our street is never swept," is the common cry, but the records show differently. These records at Room 208, City Building, are open for the inspection of all citizens. The assessments vary, according to the service given, from 4 cents on most purely residential streets to 48 cents per front foot in the downtown area.

Just what service is given the taxpayer for this assessment charge? Records show that on the residential streets, where the annual charge is only about $2.00 per lot, the following average service is performed: six motor sweepings, two water flushings, four hand sweepings, and one or two rubbish collections. Formerly there were four rubbish collections.

Owing to the decrease in tax collections during the past few years, the money available for operating this activity has shrunk from a 1930 budget of $185,000 to $59,000 in 1934. No money has been available for new equipment. Only one rubbish collection was made during the current year, when 1,272 tons of rubbish were collected, at a cost of $2,896.00. The general service given has decreased to a minimum. Two mechanics are employed constantly to keep the old equipment on the road.

Where is all this dirt, snow, leaves, rubbish, and even feathers, disposed of? There are five official city dumps, conveniently located in the different sections of the city, together with about thirty privately owned lots, where this material is taken and deposited. Rubbish is dumped at these places; such material as bottles, metals, cardboard, etc., is salvaged, and inflammable material is burned. Private lots, on which dumping is permitted, are generally properties on which the owner desires the fill to be made to make them more desirable for use.

Every month, the activity of this Division covers a great deal of ground. Akron's total square yardage of paved streets is 5,305,129. Every month of the year an average of twice this yardage is cleaned, the business areas, of course, getting the most attention.

HENRY DREYER,
Superintendent, Division of Street Cleaning.

New Collection Unit at Rochester, N. Y.

THE city of Rochester has recently installed a 10-cubic-yard side-loading, hydraulically-operated Colecto enclosed garbage body on a Diamond T truck.

Photograph by courtesy of Municipal Sanitation Corporation
THE NEW ASH COLLECTION TRUCK USED IN ROCHESTER, N. Y.

GAMEWELL Offers a Complete Line of RADIO EQUIPMENT

for POLICE and FIRE DEPARTMENT Service

Police Radio Transmitter Type "CQ"

Gamewell, as exclusive Westinghouse distributor, is in a position to furnish radio transmitting equipment for municipal, county or state fire and police departments. Gamewell is the one company in the field that can take care of your police radio problem completely and without divided responsibility: 1. *survey*, 2. *sale*, 3. *installation*, and 4. *service*.

Three transmitters, models "CQ," "EB" and "EG," are available. They were designed specifically for police and fire department work and are built exclusively for us by Westinghouse, pioneers in radio broadcasting.

Type "CQ" Police Radio Transmitter

This model is designed for local and network use in cities, counties, etc., where the population is 100,000 or more. It has a power rating of from 100 to 500 watts as allowed by the Federal Communications Commission, and will take care of municipal, county and state police requirements. The "CQ" model is sometimes used as a headquarters transmitter in a two-way radio system. It is an attractive, highly efficient and easily maintained unit.

Type "EB" Police Radio Transmitter

Designed exclusively for local police radio service in cities of 100,000 or less. Has power rating of 50-watts and is of the *same unit* type construction as the larger "CQ" model. Provides all the features of the larger transmitters for the smaller city. The "EB" is also attractive and of highly efficient construction designed for easy maintenance.

Type "EG" Police Radio Transmitter

The "EG" model is an ultra-high-frequency transmitter used as a headquarters unit for an *ultra-high-frequency* two-way police system. It is of the same appearance and type of construction as the "EB" model.

Police Car and Precinct Receiving Equipment

Receiving equipment for police car and precinct stations can be supplied for both conventional and ultra-high-frequency bands. More complete literature and information will be provided on both transmitting and receiving equipment for police and fire department service upon request.

Police Radio Transmitter Types "EB" and "EG"

THE GAMEWELL COMPANY, NEWTON, MASS.

Exclusive Distributors in the United States of

GAMEWELL-WESTINGHOUSE POLICE RADIO

Police – Fire – Safety

"Muss Up the Gangsters"

So Commissioner Valentine Tells His Detectives, and Means It—Others Dissent

AT the line-up at New York City headquarters on November 26, Commissioner Lewis J. Valentine, angered at the nonchalance of Harry Strauss, a 25-year-old murder suspect, said to the 200 detectives who were present: "You men are handicapped when you face men like this. When you meet such men, draw quickly and shoot accurately. Look at him, he's the best-dressed man in this room, yet he's never worked a day in his life.

"When you meet men like Strauss, don't be afraid to muss 'em up. Men like him should be mussed up. Blood should be smeared all over his velvet collar. Instead, he looks as though he just came out of the barber shop.

"You men will be supported by me no matter what you do, if what you do is justified. Make it disagreeable for these men. Drive them out of the city. Teach them to fear arrest. Make them fear you.

"Don't treat them lightly. Make them learn that this town is no place for muscle men and racketeers. In the last ten days three honest merchants have been shot to death by quick-trigger men. Those cases have not been solved. Bring the criminals in. I will protect you and the District Attorney will protect you."

Next day in a formal statement, Commissioner Valentine said:

"What I said yesterday, I repeat today. I am responsible for the protection and safeguarding of the people of this city and of the men of my command, and it is my intention to support them in every undertaking, regardless of criticism, when I am satisfied that their action is justifiable.

"I am not surprised at criticism directed to published accounts of remarks I made to the detectives yesterday concerning the handling of thugs, muscle men, racketeers and assassins. The expressions I voiced in the line-up were those of the Police Commissioner to his men and not a play of words for publicity purposes. Lest there be misunderstanding, I would like it known that I talked to the men as responsible members of the Police Department of the city of New York, and I know that my remarks and advice and orders would be gaged from an intelligent viewpoint.

"There was no intention to voice a policy of general police brutality. I emphasized and pointed out that decisive action is to be taken in those instances where decisive action is justified.

"Habit to most of us is much like a malady—it is not easy to shake off. For a great many years many men in the Police Department of the city of New York have come to believe that racketeers, thugs and criminals, especially those whose nefarious activities gained them financial and political standing, must, of necessity, be treated with kid gloves. The habits of years cannot be erased in a day, and I am satisfied that more than one 'pep' talk similar to yesterday will be required to clearly and unquestionably make known to some of the personnel of this department that they are no longer hampered in their dealings with law-breakers.

"We have two-fisted, red-blooded, courageous men who will, when necessity arises, risk their lives, and I do not intend to permit them to be hampered in any manner whatsoever.

"I am confident the men of my Department appreciate the policy I have stated and will act accordingly. If it develops that this stand must be modified, I will not hesitate to modify it as the occasion demands."

Dissenting Views

This is of course a most interesting point of view, and one held by a considerable percentage of the population. Another group is totally opposed to the treat-'em-rough, knock-'em-down-and-drag-'em-out school. Others think that while there is a great deal to be said for the muss-'em-up method, it contains the seeds of indiscriminate police brutality. Several very brief comments are summarized below from *The New York Times*.

Frank E. Loesch, of the Chicago Crime Commission, said he supposed that Commissioner Valentine was going on the theory that violence was the only law such criminals know; but the difficulty was that the policy was likely to be abused.

Police Chief George J. Matawitz of Cleveland said he believed there was danger if police went too far and that there was a happy medium between kindness and the other extreme.

Chief B. W. Payne of Houston said he looked on the new policy for New York criminals as the treatment they deserve, but doubted that it was a good general policy.

W. W. Graves, Jr., Jackson County (Kansas City) prosecutor, said sympathetic juries were almost certain to turn loose defendants who appeared in court battered and beaten with a story of police assault.

Chief Theodore J. Roche of San Francisco said he doubted if anyone is justified in giving an order of that kind, that no policeman is justified in brutality simply because he is arresting a known criminal.

George W. Wickersham, of New York, said it was a brutal invitation to the police to resort to methods of violence in performing their functions, whether necessary or otherwise, and in his opinion afforded a striking demonstration of the fact that generally it is a mistake to appoint a member of the force as Police Commissioner.

Caution at the Wheel

AMONG the 45 posters reproduced in the November *National Safety News*, are these five on careful driving:

"Drive as if they were your own," says the first, showing two children and an oncoming car.

"Better to be late a few minutes than laid up a few months."

"Signs and signals are for your protection; heed them."

"Park close to the curb; it leaves that much less sticking out to be run into."

"Early darkness is winter's greatest danger."

Older Persons Heaviest Auto Casualties in Seattle

PEDESTRIAN fatalities at Seattle in the first ten months of 1933 numbered 14 for persons to 40 years of age, and 37 deaths for those older. For the same months of 1934 the figures are respectively 15 and 39. For six age-groups they are as follows:

	1933	1934
Pedestrians—Minors	9	5
18-30	1	3
30-40	4	7
40-50	5	10
50-60	16	9
60 up	16	20
Total	51	54
All fatalities	80	88

The speed limit on certain through streets has been increased to 35 miles, and speed is the answer to the increased fatalities.

Sparks

FORT DODGE, IOWA, has adopted a new building code prohibiting wood shingle roofs . . . Newport, Ky., may require fire retardent roof coverings on all buildings . . . Boston holds meetings for watchmen, with 500 in attendance the first session . . . Passaic plans to erect a drill tower, adopt a fire-prevention code, and demolish hazardous buildings . . . Newark demolished 163 buildings in 1933 and 117 during a part of 1934, and has listed the remaining 400 requiring demolition . . . East Orange demolished 368 buildings in 1928, 170 in 1929, 155 in 1930, 71 in 1931, 47 in 1932, 57 in 1933, and 49 in 1934 . . . Middletown, Ohio, should prohibit wood shingle roofs, says the National Fire Protection Association . . . Pawtucket Chamber of Commerce demands improvements in the Fire Department.

—Says one POLICE CHIEF to another—

"Why does your department use motorcycles for traffic control duty? Give me the low-down — I want all the facts."

Recently, in a western city, there was some speculation as to whether it would be advisable to discontinue the use of motorcycles for traffic patrol duty. The problem deserved careful consideration. Wisely, the police chief placed the question before chiefs in a number of other cities. The replies, quoted on this page, carry unusual conviction. There seems to be no doubt about motorcycles having a definite place in a well-equipped police department.

HARLEY-DAVIDSON MOTOR COMPANY
Department M — Milwaukee, Wisconsin

Quick Getaway — Low Cost — "Because motorcycles develop great speed in a short distance, are easily parked, can follow speeding cars successfully, and cost 3 to 4 cents less per mile."*

Easily Handled — "There is only one answer — motorcycles are by far the best because they are easy to handle in heavy traffic, put the uniformed officer in plain view, avoid traffic jams, and are less costly to operate."*

One Officer per Vehicle — "To successfully handle traffic from a car requires two men — and they could not do the work of one man on a motorcycle."*

Less Hazard in Traffic — "When pursuing a speeder, a motorcycle presents less hazard in traffic and can be parked out of the way when a violator is being contacted."*

Less Danger at High Speeds — "Because of efficiency, quicker getaway, less danger of collision when traveling at high speeds in heavy traffic and quicker apprehension of violators."*

Decreased Fatalities — "We have constantly decreased fatalities in this city by the use of a well-trained motorcycle corps."*

Officer in Plain View — "A traffic officer is as valuable as he is conspicuous, and he can be seen when mounted on a motorcycle."*

• • •

The question of whether or not motorcycles have a place in traffic control squads, resolves itself into a simple-arithmetic study of accident prevention records.

**Names upon request.*

See your nearby dealer or write for special Police literature.

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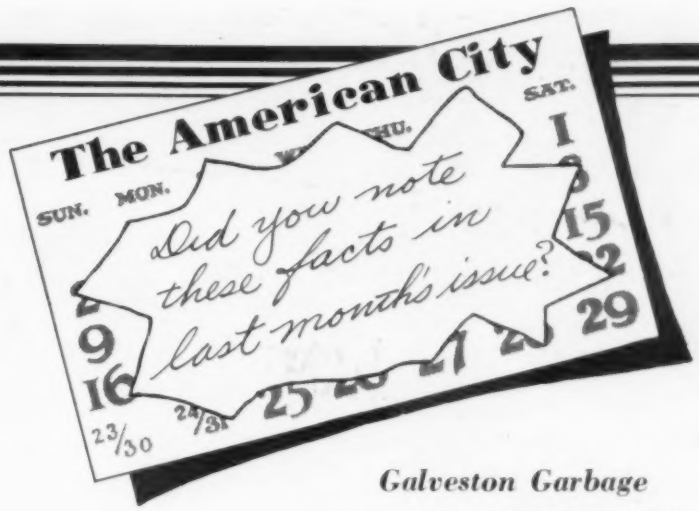


Keep Ice Off Streets

Calcium and sodium chloride used in combination with an abrasive, as cinders or coarse sand, are useful in reducing ice on icy streets, thus safeguarding life and property. Use calcium chloride on concrete pavement and for temperatures lower than 6.5 degrees below. Page 64.

Thawing Water Pipes

The timely matter of thawing water mains and services was discussed in both the November and December issues. Electricity furnishes the quickest and cheapest method; but there are occasions when steam or hot water should be used. Current thaws services in 3 to 10 minutes at a cost of $2.50 to $7.50, small mains in 1½ to 2 hours. Steam and hot water require much longer, sometimes 2 to 10 hours for a main. Purchase thawing equipment and train the organization now, is the recommendation of the article that begins on page 50 of the December issue.

Low-Cost Roads

How Georgia roads are being surfaced at low cost, begun in the November issue, is continued on page 65, December. Text and pictures show the sand-clay base being spread, swept and overlaid with either asphalt and slag or tar road-mix.

Constructive Street Maintenance

Street maintenance should not be regarded as makeshift, but as construction. Scarification, reshaping, recompacting, of untreated surfaces are cheaper than patching. Adding only 2 inches of gravel to the reshaped surface gives considerable stability. Winter is hard on roads and below-zero weather means severe contraction and cracks in hard surfaces. Much valuable instruction on cumulative maintenance is given on page 59, December.

More Work

On the front cover of the December issue THE AMERICAN CITY urged that equipment of all kinds required in public improvements be included in the Federal financing to be provided by the new Congress, and that housing projects and slum clearance projects be authorized, each either with or without the other.

The Power Report

Three particularly fine contributions in the field of electric power are to be found in the December issue, the first two due to the eminently practical report made by the Power Authority of the State of New York after three years' study, and the other to profitable utility operation by enlightened municipal officials at Bloomfield, Iowa. A rate of 2½ cents per kwh covers cost of distribution throughout New York State; 3½ cents will include generating costs as well, plus 11½ per cent overhead. How the city engineer can figure whether distribution costs are right is described on page 40.

Clarifying Colored Sewage

Gastonia, N. C., has to handle rainbow sewage that changes from red to blue in the space of an hour owing to spent dyes of the textile mills, and discharge colorless effluent to the creek. Ferric chloride performs the miracle. Full details on page 41, December issue.

Good Sidewalks for Good Money

Low prices for short-weight sidewalks cannot be quoted under the Fort Wayne penalty specifications for standard construction. First, the contractor takes out a permit, then an inspector samples his materials, and seven days later tests the concrete. The property owner pays what the job is worth, with reductions of 5 to 25 per cent for deficiencies of ¼ to 1 inch in thickness and for crushing strengths of 2,500 to 2,100 pounds. Everybody who is on the level appears to approve the plan. Page 44, December.

Efficient Sludge Drying

Sludge beds are usually not utilized to capacity. What is needed is a program of filling and cleaning. How to make them more effective is discussed on page 62.

Galveston Garbage

Galveston hauls the waste of its 53,000 residents and 100,000 guests by means of 11 motor trucks, 2 trailer units and 10 wagons, at a cost of $75,600 per year. They start out at 5:45 A.M. from the garage alongside the $42,000 incinerator, which consists of two 40-ton Dutch ovens with upper grate for wet materials. Page 47, December.

City Services with Separate Accounting

How Bloomfield, Iowa, once played Santa Claus by cancelling December electric bills is described on page 53; so are the Imhoff tank and 1934 shallow-well water system. Each of the three plants keeps its costs and receipts separately from those of the other utilities. The same administration has been in office for ten years with no other candidates now in the field.

A 9½-Acre Stadium

One of the largest stadiums in the country has been built at Albany, using as a base an 18-foot embankment surrounding an old reservoir. It is 705 x 370 feet, or 9½ acres, and adjoins a recreation park in which a clubhouse will be erected. See the December issue, page 56.

Municipal Engineers

What the depression has done to municipal engineers is shown graphically on page 58 of the December issue. Of the 100 per cent employed in 1927, nearly half were gone in 1933. Inspectors fared worst, with city planners nearly joining them in January, 1933. Administrative work was the safest to be in.

The Water Business

To meet the demand for the exclusive data on water rates and charges, these have been reprinted in convenient form and may be had for $1. The practical character of these data, covering 237 cities, may be seen on pages 81-83-85.

New ultra-high frequency radio communication system aids Newark police

Newark, N. J., operates her efficient new Western Electric ultra-high frequency police radio system at 500 watts carrier power on 30,100 kilocycles. Cruising cars receive loud and clear orders *free from atmospheric disturbances and overlapping* with other stations. The present, one-way system can easily be made two-way by adding "Talk-Back Circuit" units.

The Western Electric transmitter is compact, reliable and easily operated either from police headquarters or from a remote transmitting room. An efficient transmission line "pipes" the signal to the rod antenna at the tip of a flag pole. A new type quartz crystal accurately maintains assigned frequency. Transmitter power is drawn directly from building circuits.

Forty police cars are equipped with compact, sharp-tuning Western Electric superheterodyne receivers, having automatic volume control and operating from the car battery. Precinct stations have similar receivers operating from AC lighting outlets.

For full information on ultra-high frequency police radio equipment, write to the distributors: Graybar Electric Company, Graybar Building, New York—or telephone Graybar's nearest branch.

Western Electric 16-A Transmitter and 88-A Amplifier and (on desk) 19-A Receiver, Transmitter Control Unit and Microphone.

Western Electric

POLICE RADIO TELEPHONE EQUIPMENT

Distributed by* GRAYBAR *Electric Company. In Canada: Northern Electric Co., Ltd.

Why not remember to mention THE AMERICAN CITY?

JANUARY, 1935

Vol. L, No. 1

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

Public Works Planning on a Vast Scale Urged by National Resources Board

PUBLIC works planning and the conservation and development of America's fabulous national resources are the major subjects discussed in the report submitted to President Roosevelt last month by the National Resources Board and made public on December 17.

"Public construction in the United States" is estimated in the report to have "increased during the first part of the last decade from a little over $2,000,000,000 worth per year to a high point in 1930 of $3,300,000,000, and dropped to a low point in 1933 of 1 1/3 billions. This huge expenditure by municipalities, counties, states and the Federal Government constituted approximately one-quarter of the total construction bill—public and private—and almost a quarter of the total expense of government averaged over the 10-year period."

Discussing the probable future volume of public works, the report says:

"Based solely upon extension into the future of the average annual capital outlay for the entire United States (national, state and municipal) of about $2,400,000,000 for the 10 years 1921 to 1930, the total of capital outlays for the 10-year period 1935 to 1944 may be estimated as approximately $24,000,000,000. Of course, such an extension of a past average makes no allowance for the factor of growth which has been so notable in past American expenditures upon public works and which presumably should and will continue in the future. Hence the 10-year total suggested may be regarded as a minimum estimate.

"By adjusting past rates of capital outlay for individual classes of public works according to readily available evidence as to relative need and with a degree of optimism as to possible correction of the more glaring deficiencies in service, we reach an estimate for the 10-year period, 1935-44, of approximately $26,000,000,000. This estimate, like the preceding one, makes no allowance for growth.

"Extension of public works into new fields and expansion of all public works, old and new, into the field of reasonable possibility from the point of view of needful public service, brings the estimate of magnitude of all public works over a period of perhaps 20 to 30 years to about 105 billion dollars or about 3½ to 5 billion dollars a year. Such an expanded program of public works would amazingly improve the public services and living standards of this country; but viewed in the light of traditional expenditures for public works the cost seems a heavy charge upon the national income. Whether 5 billions a year for roads, parks, sewers, public libraries, forests, waterways, good housing, and countless such other facilities, is more than we should spend is a problem which we shall have to solve in the light of future developments touching the aggregate national income, public finances, modes of combating unemployment, popular demands for pleasures and protections afforded by public works, etc."

Streets and Highways

Under the heading of "Public Works and Transportation," the National Resources Board urges that: "Since much more highway and street work is not only probable but in many cases desirable, it is important to have plans ready to secure the full value for the money to be spent."

"The next steps in road development," says the report, "would seem to lie primarily in—

"(a) Classification and development of roads for specialized uses—as heavy-duty highways without grade intersections, freeways, parkways, provisions for pedestrians, bicyclists, and horseback riders, etc.

"(b) Improvement of alignment, grades, and roadsides on greatly widened rights-of- way for existing roads.

"(c) Development of rural roads, and

"(d) Abolition of grade crossings with railroads, and, where traffic demands, with intersecting highways.

"Each of these four aspects of road work will absorb huge sums of money during coming years and long-range plans carefully related to other methods of transportation, probable population trends and industrial development must be prepared in advance to avoid wasteful mistakes. We cannot afford many examples like the million-dollar bridge in Tennessee which was located below the flood line of a proposed reservoir.

"For new special-purpose roads we already have a number of examples of both expensive and inexpensive methods of procedure. Presumably, for instance, it is no longer necessary to argue the desirability of by-passing through traffic around congested centers and towns instead of forcing through them at great expense of time and money. With the successful parkway developments in Westchester, N. Y., the lake front of Chicago, and the Mount Vernon Parkway at the nation's capital, the value of that type of pleasure-way has been demonstrated. The new 'freeway' between Norris and Knoxville in the Tennessee Valley provides another example.

"Much also needs to be done to make our existing highways more useful, efficient and pleasurable. Perhaps the chief need is wider rights-of-way to permit expansion, better curvature and grades, or roadside improvements. It is estimated in the land report that recreational use forms at least 60 per cent of the total use of automobiles, a showing which

would seem to justify more attention to the control and preservation of roadside appearance.

"In the third field suggested—further hard surfacing of rural roads—it is difficult to estimate how far such a program should go. Many rural roads would be vacated under a program for the retirement of submarginal lands, and the traffic on others would not warrant expenditures for all-weather service. If 20 per cent of the unpaved rural roads are eliminated, by this reasoning there still remain over 1,750,000 miles of unimproved third-class country roads to be considered. A rough estimate of $2,000 per mile produces the total of 3½ billions of dollars.

"Finally, in the matter of grade crossings another huge outlay of funds seems probable, particularly if high-speed, light railroad trains are to become common. The American Engineering Council in a report dated April 7, 1933, suggests the early elimination of 5,000 selected railroad grade crossings at an estimated cost of $500,000,000. It has been variously estimated that further eliminations to the amount of 12 billion dollars would be justified. The prospect of such expenditures justifies forethought and planning to concentrate attention on the most-needed cases of grade separation and to avoid any construction where rearrangements of roads or rails for other causes may make a saving possible.

"Many rearrangements of transportation facilities might result from consideration of the effective use of all methods of moving goods and people, instead of compartmental planning of one method at a time. For instance, the very extensive highway development in the country has already made it clear that much of the railway branch line mileage is unnecessary, and the towns on railway branch lines can be better and more cheaply served by the highways. This fact, indeed, is one reason why the railways are now suffering so seriously. A partial solution seems to be to convert some of these railway branch lines into motor highways by paying the railways a fair price for these branch-line rights-of-way and substituting for the little-used railway a good highway. This should accomplish a dual purpose, (1) permitting the railways to abandon unprofitable lines and amortizing ways to abandon unprofitable lines and amortizing so much railway capital, and (2) supplying a right-of-way or highway at moderate cost which will be not only very direct, but frequently on a better location as to gradients and curvature than the ordinary highway. In our great cities a better coordination of terminals farther out from the center of city would release large areas for more efficient uses.

"Railroad reconstruction and modernization is now a public work within the terms of the act establishing the present Public Works Administration, and again seems likely to require large sums in the near future.

"Not only rail and highway, but also waterway planning, must be coordinated. Estimates for river projects based on studies by the Corps of Engineers run as high as $8,000,000,000. Before any such program is undertaken, coordinated transportation plans should be worked out. Too often in the past expensive construction of waterways has been advocated and approved not with anticipation of their actual use, but primarily as a method of controlling transportation rates. That method of railroad rate regulation is extravagant and wasteful of public funds when administrative action can be substituted."

Permanent National Planning Agency Advocated

The ideal of the National Resources Board is effectively set forth in the preface to the report:

"The natural resources of America are the heritage of the whole nation and should be conserved and utilized for the benefit of all of our people. Our national democracy is built upon the principle that the gains of our civilization are essentially mass gains and should be administered for the benefit of the many rather than the few; our priceless resources of soil, water, minerals are for the service of the American people, for the promotion of the welfare and well-being of all citizens."

The principal recommendation of the Board is the development of a permanent agency to plan for the nation on a scientific basis and with understanding of all elements involved in the problem.

The program, the Board says, may be expected, if carried through, to:

"1. Provide for the systematic development of our water resources for purposes of sanitation, power, industrial uses, transportation, recreation, domestic consumption, and other collateral uses on a far higher level than ever before.

"2. Remove the recurring menace of great floods and vast losses to persons and property.

"3. End the heavy losses of soil caused by uncontrolled erosion.

"4. Eliminate the use of land incapable of affording a minimum standard of living, develop agricultural production on the most suitable soils only, and aid in raising the standards of living in many agricultural regions.

"5. End the wasteful use of our mineral resources and substitute a national policy of mineral conservation.

"6. Make available large areas of land for purposes of popular recreation.

"7. Assemble basic data in regard to mapping, public finance, and population, necessary for national planning.

"8. Avoid the extravagance caused by failure to coordinate public works—Federal, state, and local; bring about better programming of socially useful public works; prepare public works projects suitable, if desired, for use in emergency situations.

"9. Provide for continuous long-range planning of land, water, and mineral resources in relation to each other and to the larger background of the social and economic life in which they are set."

Commenting on these findings, the Board says:

"It is of course idle to expect that the mere declaration of a set of policies will automatically produce such results. Legislation, administration, cooperation of many different types of government on many levels, and strongly supporting public opinion—all are necessary to bring about substantial changes of the kind just indicated. Nor can it be forgotten that the use of natural resources is not a thing apart, but involved closely in the whole mass of human activities, with industry, labor, finance, taxation. Natural resources planning is not planning at all, if it leaves out of account the many vital factors in our economic and social life, the resultant of which makes a standard of living.

"It is the judgment of your Board, however, that the broad policies here outlined would, if put into practical execution, with the hearty and continuing support of the Government and the people of the nation, lead to very substantial gains in the nation's wealth and in the broad distribution of human welfare at which our national policy aims."

The National Resources Board, which directed the study and development of the plan, is composed of Secretary of the Interior Harold I. Ickes, Chairman; Frederic A. Delano, Vice-Chairman; and Secretary of War Dern, Secretary of Agriculture Wallace, Secretary of Commerce Roper, Secretary of Labor Perkins, Relief Administrator Hopkins, Dr. Charles E. Merriam and Dr. Wesley C. Mitchell. The latter two and Mr. Delano comprise the Advisory Committee. The Board was assisted by several technical committees and a staff under the direction of Charles W. Eliot, Executive Officer.

Detroit Builds Cement-Bound Macadam to Relieve Unemployment

THE city of Detroit, Mich., recently completed half a mile of 24-foot cement-bound macadam pavement, which forms a needed cross street between two through streets. This worth-while improvement was made possible by the cooperation of city, county and Federal authorities and was handled as a work relief project.

The pavement is 24 feet wide and was constructed in 12-foot widths, with a butt construction joint on the center line. Each 12-foot lane had a designed thickness of 9 inches at each edge and 6 inches in the interior portion. Cores, drilled from the center portion after the project was completed, averaged 7 inches in length.

Materials and Equipment

The coarse aggregate was slag from one of the nearby steel mills. For the first half of the job it ranged from 1½ to 3 inches in size, and for the rest from ¾ to 2 inches. The fine aggregate was river sand, screened on the job to eliminate particles larger than ⅛-inch.

The equipment consisted of an old 21-E mixer which belonged to the city, a 5-ton roller, city-owned trucks, 3-inch wood forms, hose and small tools such as a tamping template, a long-handled float, shovels and brooms. An 8-ton roller was tried, but proved too heavy, for it made ruts in the surface and forced coarse aggregate into the subgrade.

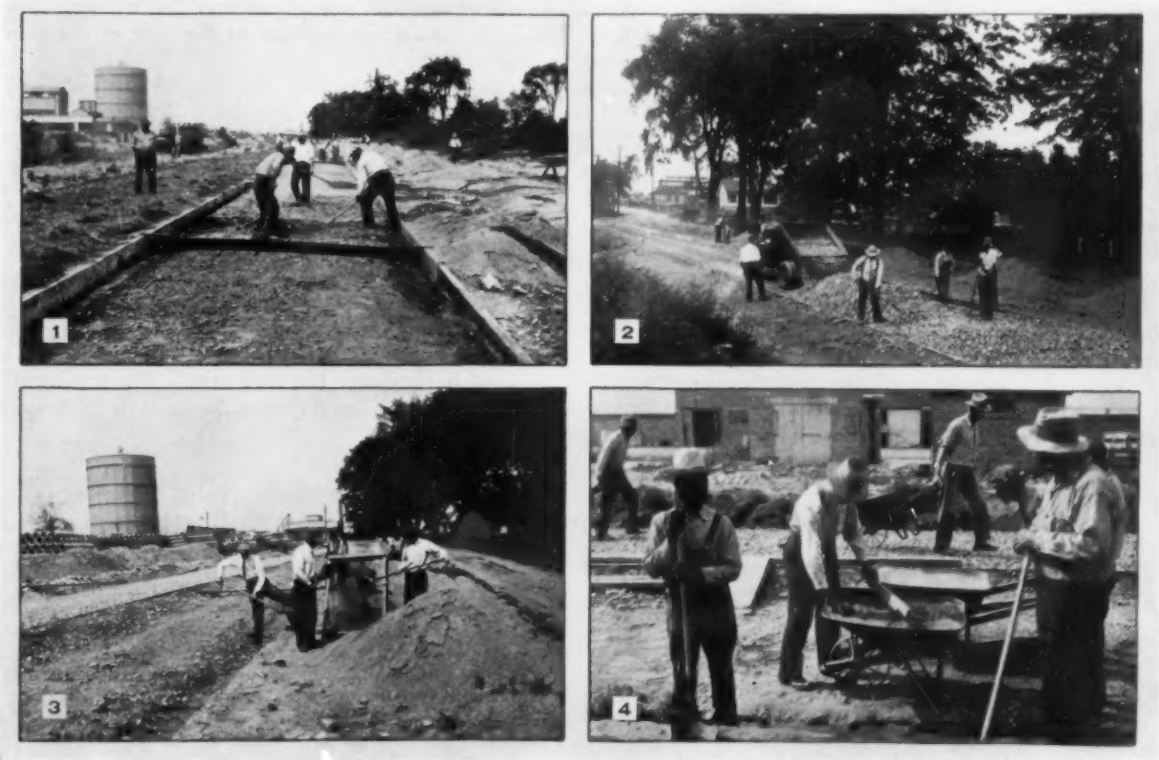
Hand Work Predominated

Each man was allowed to work 24 hours a week. Two separate crews averaging 60 men each were used, the first working Tuesday and Wednesday, and the second Thursday and Friday, of each week. Both crews worked Monday, which was pay-day. Laborers were paid 50 cents per hour.

The subgrade was prepared by hand and checked with a subgrade template. Slag was then dumped upon it and spread to the proper elevation by hand. The loose slag was rolled to reduce voids and iron out inequalities.

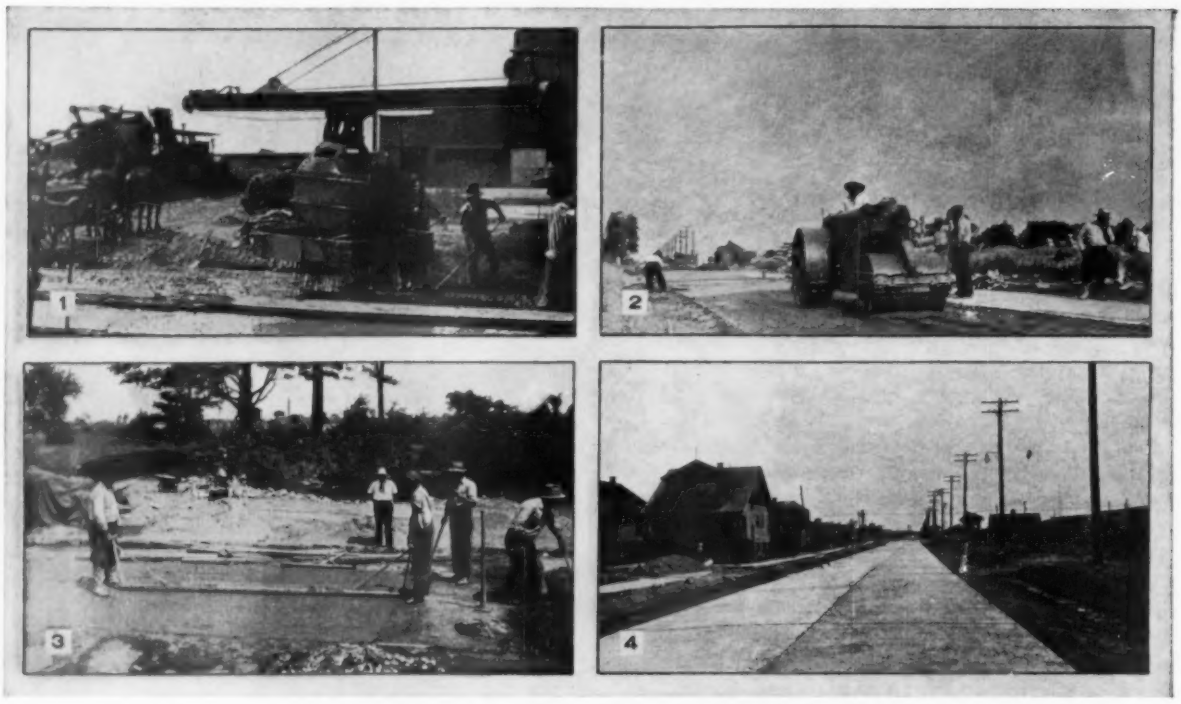
The grout was proportioned one sack of cement to two cubic feet of sand. The sand was measured in wheelbarrows, each barrow being struck off with a template to assure correct quantities.

Enough water was added to the grout to secure a flow of 20 to 21 seconds through the flow cone when 1½ to 3-inch slag was used, and 19 to 20 seconds when ¾- to 2-inch was used. The water-measuring equipment on the



PREPARATION FOR CEMENT-BOUND MACADAM PAVING IN DETROIT

1. The subgrade was prepared by hand and checked by a template that rested on the side forms. 2. The slag coarse aggregate was spread by hand, then compacted and ironed out with a 5-ton roller. 3. The sand was screened by hand to take out everything that would not pass a No. 8 sieve. 4. The sand was measured in wheelbarrows and struck off with a template to assure accurate measurement



PLACING AND COMPLETING THE CEMENT-BOUND MACADAM

1. A wooden box with 1-inch holes bored in the bottom was hung on the mixer bucket to break the grout into small streams. 2. The grouted slab was rolled with a 5-ton roller to reduce voids, true-up the surface, and work out free water released from the grout. 3. A longitudinal tamp, made of a steel channel, followed the roller to assure a smooth riding surface. 4. A completed section of the cement-bound macadam slab

mixer was not the modern, accurate type, but frequent flow cone tests controlled the grout consistencies with remarkable accuracy.

Checking the Grouting

Hand holes were frequently dug to the subgrade as a check on penetration, and in every instance grout ran into the hole first at the bottom, while surface grout was still two feet from the hole, indicating penetration to the subgrade. Complete penetration was later found in cores drilled from the completed pavement.

The mixer was equipped with boom and bucket discharge. A wooden distribution box with 1-inch holes bored in the bottom was hung on the bucket so that the batch dropped into the box. This was done to reduce the velocity of the grout and break it up into small streams that would more readily penetrate the coarse aggregate. Excess grout was pushed forward with street brooms. There was no tendency whatever for sand to settle out of the grout.

After grouting, the slab was allowed to stand until the grout had lost some of its excess moisture, before it was rolled. This interval was at least an hour and sometimes considerably longer. Earlier rolling made waves in the surface.

After rolling, the slab was tamped with a straight-edge equipped with plow handles and operated parallel to the center line. This took out inequalities. Any remaining high spots were leveled with a sidewalk tamp.

Surface grout was next distributed with a long-handled float, and the final finish was given by dragging a wide strip of burlap over the pavement. The pavement was cured with marsh hay kept wet for at least three days by sprinkling.

Private Corporations to Finance Delinquent Tax Collections

THE new plan to facilitate the collection of municipal taxes, and to relieve delinquent taxpayers of heavy penalties, which was authorized by the 1934 New York Legislature (as mentioned in THE AMERICAN CITY for June, 1934) is attracting considerable attention in the cities of New York State and elsewhere. The plan was outlined to civic leaders on December 11 by Dr. Paul Studenski, Associate Professor of Economics of New York University, at a luncheon conference at the Bankers Club, New York City, at which Comptroller Joseph D. McGoldrick was the guest of honor. Dean John T. Madden, School of Commerce, Accounts and Finance, New York University, headed the conference committee.

The plan provides for the formation of private finance corporations to extend loans to taxpayers for the payment of delinquent and current taxes. The loans, according to Dr. Studenski, would be made at a rate of interest considerably below that obtainable on ordinary business or commercial loans, the lower rate being made possible by provisions giving these loans the same security which the city holds in its tax liens against the property. The delinquent taxpayer would benefit by avoiding the 10 per cent penalty, paying only the low rate of interest on the loan; by avoiding foreclosure proceedings, and by the substitution of twelve monthly installments for the present lump-sum annual or semi-annual payment. The municipality would benefit by the immediate conversion of its tax arrears into cash; by a greater liquidity in its income; and by an improvement in its credit standing.

An exposition of the plan in booklet form is available on application to Dr. Studenski at New York University.

Drying Sewage Sludge on Vacuum Filters

By FRANK WOODBURY JONES

Sanitary Chemist, George B. Gascoigne, Consulting Engineer, Cleveland, Ohio

AS with sand filters, the type and character of the applied sludge control the output from vacuum filters. It is now standard practice, first, to prepare or condition sewage sludge by the aid of chemicals so that when applied to the filter it will part with its water most rapidly. The kind and amount of conditioner to add is the real problem for the plant operator, since this is perhaps the largest single item in operating costs. The conditioner most commonly and acceptably used is ferric chloride. Lime and ferric chloride also have been used successfully, and other chemicals alone or in combination have given some promise.

Experience at Milwaukee, Charlotte, High Point and Hagerstown indicate that when filtering activated sludge, the average output is 2 pounds or less of dry solids, per square foot of filter area per hour of operation. The cake as it leaves the filter contains 80 or more per cent moisture. Results from filtering chemically precipitated sludge at Dearborn gave an average of 7.5 pounds of dry solids per square foot per hour, when using 130 pounds of calcium oxide and 31 pounds of ferric chloride per 1,000 gallons of sludge. The cake averaged 62 per cent moisture.

The filtration of digested sludge is still in the experimental and demonstration stages. At Columbus, Imhoff tank sludge was filtered using ferric chloride alone and in combination with lime as a conditioner. The filter was 3 feet in diameter by 2 feet long, having 18 square feet of effective filtering surface. Cake produced averaged around 70 per cent moisture, and "it may be said that from 4 to 5 pounds dry solids per square foot filter area per hour was a rate not difficult to maintain."

The work at Baltimore was most thorough and has been published in detail in our most excellent official organ, the *Sewage Works Journal*. Two types of vacuum filter were used, one having 16 square feet of filter area and the other 18 square feet. "When dewatering the same sludge with all other conditions alike, it is believed that the capacities of the two filters should be about the same."

The work at Baltimore demonstrated that sludges are not constant in their response to conditioners, and also that yields vary within rather wide ranges. In one group of experiments with ferric chloride added in amounts of from 3.79 to 8.11 pounds of anhydrous material per 100 pounds of dry solids to be filtered, it was found that the quantity of sludge dewatered increased as a greater quantity of ferric chloride was used, until an average maximum output of about 11.5 pounds of dry solids per square foot of filter area per hour was dewatered when using about 6.8 pounds of anhydrous ferric chloride per 100 pounds of dry solids. The average moisture in the cake was 74.8 per cent, and the pH value varied from 6.1 to 6.7.

In another group of experiments, "the quantity of ferric chloride used was varied from 5.60 to 17.11 pounds per 100 pounds of dry solids in the sludge, with an output of from 5.3 to 27.4 pounds of dry cake per square foot of filter area per hour." This sludge would not filter properly when using less than 7.0 per cent ferric chloride. From these experiences it was concluded that: "In order to determine the filtrability of digested sludge under all conditions, a continuous series of tests lasting at least one year should be made."

At Baltimore, three estimates of cost were made, the first on the basis that one type of digested sludge could be filtered using 5¼ pounds of ferric chloride per 100 pounds of dry solids, to yield 7.6 pounds of dry solids per square foot of filter area per hour. A reduction of 10 per cent was included, as in the other estimates, to allow for a factor of safety.

It was estimated, also, that another type of sludge using 8.0 pounds of ferric chloride per 100 pounds of dry solids would yield 14.0 pounds of dry solids per square foot of filter area per hour, whereas chlorinated copperas in the amount of 11.0 pounds per 100 pounds of dry solids was expected to produce 8.8 pounds of dry solids per square foot of filter area per hour.

Experience at Cleveland

At Cleveland, Ohio, an Oliver filter 5 feet 4 inches in diameter by 10 feet long, having a filtering surface of 165 square feet, was placed in operation in 1933, and about 100 runs of from one hour to three hours duration were made between April and November. Imhoff tank sludge was used for some 20 runs, whereas separate tank digested sludge was used in the others.

At first it was quite difficult to adjust the dosage of ferric chloride, owing to frequent partial stoppages in the sludge pumps. The average results, and particularly those in the latter tests when the mechanical difficulties were straightened out, are regarded as representative of what can be done with the Cleveland sludge under the conditions at that time.

From April to July, 21 runs on Imhoff tank sludge may be summarized as follows:

	Minimum	Maximum	Average
Gallons filtered per run	900	5,860	2,877
Length of run in minutes	50	184	102
Per cent volatile matter in sludge	54.5	59.9	54.88
Per cent moisture in sludge	95.1	90.4	93.46
Alkalinity, parts per million			1,900
Per cent ferric chloride added (dry solids basis)	4.9	16.4	8.45
pH of filter feed	4.9	6.0	5.3
Per cent moisture in filter cake	67.3	75.4	71.8
Yield, pounds dry solids per square foot per hour	3.1	7.9	5.66

In July and August, 19 runs were made on sludge from separate digestion tanks, which were supplied with fresh solids from the Imhoff tanks. A summary of the results obtained shows:

	Minimum	Maximum	Average
Gallons filtered per run	1,805	3,910	2,892
Length of run in minutes	70	180	124
Per cent moisture in sludge	94.7	88.2	90.1
Per cent volatile matter in sludge	41.3	47.6	45.4
Alkalinity, parts per million			2,450
Per cent ferric chloride added (dry solids basis)	4.54	17.1	8.67
pH of filter feed	5.1	6.3	5.8
Per cent moisture in filter cake	65.9	70.5	68.0
Yield, pounds dry solids per square foot per hour	5.4	10.7	7.53

Runs made on separate digested sludge in September and October are summarized as follows:

	Minimum	Maximum	Average
Gallons filtered per run	1,784	3,947	3,256
Length of run in minutes	85	185	150
Per cent of moisture in sludge	87.30	93.17	90.79
Per cent volatile matter in sludge	45.88	52.02	48.97
Alkalinity, parts per million	2,090	3,790	3,070
Per cent ferric chloride added (dry solids basis)	4.60	10.00	7.69
pH of filter feed	5.9	6.8	6.4
Per cent moisture in filter cake	68.27	72.62	70.30
Yield, pounds dry solids per square foot per hour	4.23	9.15	6.21

A similar summary of 15 runs on separate digested sludge made in November shows:

	Minimum	Maximum	Average
Gallons filtered per run	1,840	3,086	2,791
Length of run in minutes	115	185	152
Per cent of moisture in sludge	90.25	93.34	91.25
Per cent volatile matter in sludge	49.40	55.04	51.75
Alkalinity, parts per million	2,210	4,200	3,610
Per cent ferric chloride added (dry solids basis)	5.62	10.10	8.15
pH of filter feed	6.3	6.9	6.5
Per cent moisture in filter cake	70.36	73.55	72.06
Yield, pounds dry solids per square foot per hour	4.10	5.91	4.98

A study of these summaries shows there was progressive falling-off in the yield, although the differences in the average amounts of ferric chloride added was relatively small. The decreased output was attributed in part to the condition of the filter cloth and in part to the condition of the sludge.

Conclusions

A study of the work done so far at Cleveland does not reveal any outstanding correlation between characteristics of sludge, per cent of conditioner and output. However, certain tendencies were apparent which justified tentative conclusions, summarized as follows:

1. Digested sludge can be conditioned with ferric chloride and be filtered.
2. The yield of filter cake is greater, the greater the per cent of solids in the sludge.
3. The percentage of volatile matter in the digested sludge, between 45 and 53 per cent, apparently has very little bearing on the yield of filter cake, except for a very slight tendency toward greater yield the lower the volatile matter.
4. The percentage of volatile matter in the digested sludge, between 45 and 53 per cent, has no direct bearing on the quantity of ferric chloride used for conditioning.
5. The per cent of ferric chloride used increases the yield up to a certain point, after which increased ferric chloride produces no greater yield but apparently a falling-off. The optimum percentage of ferric chloride for greatest yield in the digested sludges used was around 8.
6. The effect of akalinity and pH of the initial sludge on the amount of ferric chloride required is still to be determined.

Observations made during the operation which apparently are supported by the results point to the following conclusions:

1. A dense sludge, that is, one with moisture as low as 88 to 90 per cent, can be filtered, without dilution other than that necessitated by the ferric chloride solution.
2. The best results on separate digested sludge are obtained when the pH of the filter feed is betwen 6.3 and 6.5. This may or may not be true for Imhoff tank sludge.
3. With separate digested sludge, at least, it was found necessary that the moisture in the cake be under 75 per cent, otherwise it would not leave the filter cloth without smearing.
4. The filtrate is clear and contains some iron in the ferrous state. It is inoffensive as regards odor.
5. Filter cake from digested sludge can be stored without causing offense, at least in piles which are relatively small.
6. With continued use the filter cloth becomes clogged, and efficiencies both as to yield and dryness of cake fall off. As the clogging of the cloth progresses, it is necessary to reduce the filter speed in order to produce a removable cake.
7. Apparently, the behavior of the sludge as regards filtering changes with the seasons.

Area Required

It must be borne in mind that vacuum filtration of digested sludge is still in the demonstration stage. With full recognition of the fact that digested sludge can be filtered effectively, it must nevertheless be remembered that large-scale plant operations will present problems not dreamed of in experiments. Who, for example, in the early days of separate digestion realized what a problem the proper disposal of supernatant liquor would become? It is to be expected, therefore, that in common with past experience some of the results obtained to date will be tempered by full-time actual plant performance. For this reason, for separate digested sludge such as we have in Cleveland at the Westerly plant, our present conclusion is that at least 8.0 per cent of ferric chloride will be required to produce an output of between 4 and 5 pounds per square foot of filtering area per hour on a year-round basis.

Cost of Sludge Dewatering by Sand Filters

Any attempt to present cost figures for the dewatering of sewage sludge, whether by sand filters or by vacuum filters, is beset with difficulties on every hand. While total expenditures reflect the cost to the taxpayer, the real cost of the treatment process can be determined only by expressing the amounts paid out in terms of production, such as per million gallons or tons of dry solids. Actual expenditures for the operation and maintenance of sand filters on individual plants are available, but any effort to turn these figures into unit costs on a dry solids basis is likely to lead to erroneous results.

In general, however, it may be stated that open sand sludge beds with appurtenances have been constructed at costs anywhere from $0.30 to more than $1.00 per square foot. Greenhouse coverings are additional, and vary between $0.85 to $1.70 per square foot of filter area. A liberal estimate for covered sludge beds complete with appurtenances would range between $2.00 and $2.75 per square foot of filter area, depending upon the location and size of the installation.

The operating cost for removal of sludge cake, including final disposal to a dump, is usually between $0.40 and $0.60 per cubic yard. From information obtained regarding the upkeep of greenhouses, it is learned that painting and glazing inside and out every three years should not exceed $0.03 per square foot per year. Other costs, such as sand renewal, estimated at 2 inches per year, insurance on glassovers, and upkeep of equipment, would be well covered by an allowance of $0.04 per square foot per year. These figures, based on installations approximating 14,000 square feet, would be increased somewhat for smaller units and decreased for larger.

On the above basis, the total annual cost, with 20-year life of the structures, would range between $8 and $9 per ton of dry solids. Operation and maintenance costs, not including interest and depreciation, would vary between $4 and $5 per ton of dry solids.

Sludge Dewatering Costs by Vacuum Filtration

In estimating the cost of vacuum filtration, provision must be made for a building to house filters and accessories, such as pumps, piping, mixing equipment, compressors, chemical storage and the like. It must also be borne in mind that in setting up a vacuum filtration plant, certain spare units must be provided to guard against shutdowns and to assure continuous service. This differential is absorbed the larger the installation. It is questionable, therefore, whether vacuum filtration can compete on an installation cost basis in small projects.

Estimates made recently to filter about 10 tons of dry solids per day, including elutriation, showed a total cost, including land, of $388,000.00. Exclusive of elutriation and other appurtenances not directly essential to the filter installation and to the facilities for the disposal of cake, the construction cost reduces to $250,000. Operation and maintenance costs, exclusive of interest and depreciation, are estimated at $19,000 annually, or approximately $5.20 per ton of dry solids. The total annual costs are computed at $12.50 per ton of dry solids.

Operation and maintenance costs of vacuum filtration will be greater than for sand-bed drying in small and medium-sized plants. This has been shown by the late E. G. McConnell at Charlotte, N. C., and also may be deduced from preliminary figures given by Wellington Donaldson for Hagerstown. In large-sized plants the costs will be more nearly parallel. Until such time, however, when more definite and representative data than now obtainable are available, comparative cost figures should be viewed with an open mind.

ACKNOWLEDGMENT.—From a paper presented at the Eighth Annual Conference of the Pennsylvania Sewage Works Association.

Cost of Asphalt Pavement Maintenance in Fort Wayne, Indiana

By W. W. DROEGE

Asphalt Superintendent—Paving Chemist

MORE and more as time goes on, one sees desire on the part of public officials to cooperate to the utmost extent in providing for minimum inconvenience to traffic and at the same time to obtain work at the lowest possible cost. This is in marked contrast with some of the early practice of years ago where maintenance and reconstruction were frequently accomplished with barricades or with detours. The following report on work done in Fort Wayne for the first eight months of 1934 is of interest in this connection.

Municipal Plant Furnishes All Material

The asphalt plant is municipally owned and work is carried on the year around. Any complaint as to the condition of an asphalt pavement is investigated immediately, and if repair is required, the work is taken care of without delay. The slogan of the city is that "no street is barricaded and the motorist always has the right-of-way." The mixtures are designed so that they are available at once for traffic as soon as they are placed, and detouring is unnecessary. Close laboratory control is kept at all times, and in the case of emergency patching, work has been done in as low as zero temperature.

The total maintenance cost per square yard for street pavements during 1934 is approximately $0.007. Reduced to the equivalent of a mile of pavement, 20 feet wide, this is approximately $80 per mile. The accompanying table indicates the amount of asphalt mixture turned out and the average age of all pavements repaired, and is of interest in showing the amount of mix required in repair per square yard of total pavement under maintenance. The yardage under maintenance is substantial (nearly three million square yards), and the figure of one pound per square yard per year average affords a comparison for other years and other conditions.

Month	Tons New Asphalt Mixture Manufactured and Used	Average Age in Years All Pavements Repaired
January	48	24
February	31	23
March	55	24
April	161	28
May	133	17
June	135	17
July	173	14
August	116	16
Average per month	106	..

Total tons new asphalt mixture manufactured and used first 8 months of 1934	852
Total days actual repair operation in first 8 months of 1934	163
Average age all pavements repaired first 8 months of 1934	20.37 years
Total area of asphalt pavement surface out of guarantee period, January 1, 1934	2,820,337 sq. yds.
Number of men appearing on asphalt plant payroll that cover above yardage yearly (that is street, truck and plant force)	12
Number pounds asphalt mix per month per square yard of pavement	0.08
Number pounds asphalt maintenance mix per year per square of old pavement gone over approximately	1.0

Winter Damage to Old Pavements

The effect of severe winter conditions is to be noted in that the older pavements required the principal repairs, since only emergency patching is carried on during extremely cold weather. In January, for example, the average age of pavements requiring such repairs was 24 years, while pavements of lesser age could be carried until more favorable weather. During the whole winter but few repairs were required upon pavements less than 20 years old. In the summer months, routine maintenance is given to all pavements, bringing them to a standard condition. The amount and kind of maintenance given is determined by a definite system in which the factors of age, condition of base, traffic volume, and surface texture are all considered. In other words, "A stitch in time saves nine," and it saves the public temper as well.

Municipal Water Works Made Attractive to the Public

Well-operated Plant of Columbus, Ga., Handles Highly Turbid Water Through Equalizing Storage

THE municipal water works of Columbus, Ga., is located about two miles north of the city on a main highway, with adequate grounds containing a natural wooded dell and other interesting features. The Board of Water Commissioners has impressed this attractive spot upon the consciousness of the water consumers by developing it for picnics and outings. Lest there be untoward use of the area, the entire water-works grounds, as well as every part of the plant where there might be danger of accident to visitors, is fenced completely and attractively with Cyclone fence. The picnic grounds, the barbecue pits and stone ovens are open for the use of any who will behave themselves. No one is admitted to the grounds after 8 at night unless special arrangements have been made by telephone, for the gates are shut at that time, and all visitors must be out by 10. The woods are lighted adequately for evening picnics and the paths are cleared of all obstructions.

The grounds are well landscaped, and the natural attractiveness of the grassy slope below the filtration plant has been enhanced by the construction of a small waterfall supplied with about 18 gallons of water a minute from the clear-water basin, and falling over a series of stone steps, making a small wading pool for the youngsters, and then winding its way down the slope to a fish pool and overflowing into a pond filled with various kinds of water plants. The grounds have been planted with over 1,000 shrubs and trees of the area, and many are labeled for the benefit of students.

The Water Department has not stopped at merely making the plant attractive to the public, but has equipped it with every device for insuring a safe and palatable water for the consumer.

Intake in the Chattahoochee River

The turbidity of the Chattahoochee River, the source of the water supply of Columbus, varies from a maximum of 6,000 to a low of 20 and an average of 250. The stage of the river varies within a limit of 5 feet, since the intake happens to be at the fall line of the granite of the state, which acts as a natural dam. The great problem is rather the handling of the large amount of sand brought to the intake by the river.

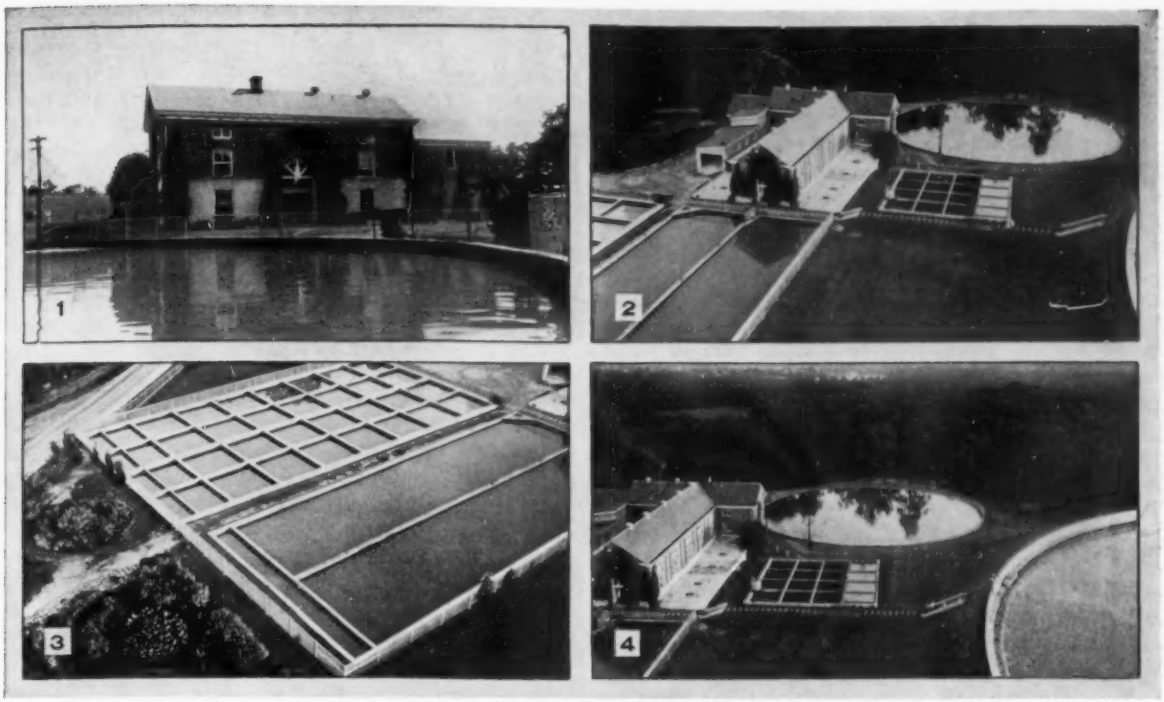
The intake is flatiron in shape, with the point headed upstream. The intakes are on the sides and have grids spaced 1¼ inches, there being no other screens. From the intake a 30-inch cast iron line leads to the pump suction or sand settling well, a distance of 350 feet. The sand-pit is 40 feet long and 20 feet wide and has a water depth of 14 feet and below that a depth of 14 feet for catching the sand. A herringbone pipe system laid on the bottom of the sand-pit consists of an 8-inch header and 6-inch laterals, each with a valve which controls the flow to a Morris vertical sand pump driven by a G-E motor for removing the sand. This is supplemented by a Morris mine-sinking pump hung from a chain falls used for cleaning out between the pipe grids. The sand pumps discharge below the pump station and handle as much as one-half a car of sand a day.

Low-Lift Pumping Station

The pump suction pit is separate from the sand-pit and

SCENES IN THE PICNIC GROUNDS OF THE COLUMBUS, GA., WATER WORKS

1. A view down the grassy slope toward the lower lagoons filled with water plants. 2. The artificial waterfall and wading pool at the top of the glade. 3. Looking up the slope from the lily pond



THE FILTRATION PLANT OF THE COLUMBUS WATER WORKS

1. The front of the filter building as seen across the clear-water basin. 2. The plant viewed from the balcony of the wash-water tank, showing from left to right the new and old settling basins, the chemical shed, filter building, mixing channels, circular clear-water basin with picnic woods beyond, and at the extreme right the edge of the 45-million-gallon raw-water storage basin. 3. The new and old settling basins from the wash-water tank. 4. A view similar to 2, but showing a portion of the city in the distance

is remarkably free from any inflow of sand. There are three low-lift pumps now installed and a new unit is planned to replace one installed in 1919. The pump installed in 1919 is a 2-stage Morris centrifugal with a capacity of 6 mgd driven by a 300-hp G-E induction motor. In 1925 a DeLaval 2-stages in series centrifugal was installed with a capacity of 7 mgd, driven by a G-E 400-hp induction motor at 1,200 rpm. The newest pump—a unit of which the officials are rightfully proud because of its efficiency—is a 10-mgd DeLaval having 2 stages in series and operating against a 208-foot head. It is driven by a 500-hp G-E synchronous motor at 900 rpm. The motor efficiency is 87 per cent and the pump efficiency 96 per cent, as determined by extensive tests by Prof. Arthur M. Greene, Jr., of Princeton University.

All three pumps deliver to a 24-inch discharge line 2,500 feet long, with a 208-foot total discharge head from the river to the 45-million-gallon concrete-lined storage reservoir at the filtration plant. The lining extends only one-half the depth of the 20-foot reservoir, which measures 900 feet long and 500 feet wide, with semi-circular ends. The chief advantage, aside from the availability of storage in case of a temporary crippling of the power lines to the pumps at the river, is in the leveling-off of the high peaks of turbidity in the river. There is little actual settling of turbidity in the reservoir, owing to the low coefficient of fineness of the Chattahoochee River turbidity. With the limits of river turbidity of 6,000 and 20, as mentioned before, the maximum turbidity of the storage reservoir never exceeds 900, mostly due to being able to select water off the maximum peaks of turbidity in the river and to mix-in sufficient water of low turbidity to keep the average low.

Water is drawn from the storage reservoir through a mixing tower with three inlets, a 24 x 24-inch inlet at the bottom, another the same size at the mid-depth, and one of 18 x 18 inches 5 feet from the surface of the reservoir. Only the top inlet is used. The reservoir has not been cleaned since it was placed in service in 1916, for the settling-out in this basin is practically negligible.

Chemical Treatment and Mixing

The water flows from the storage reservoir by gravity through a 30-inch cast iron line to a 20-inch Ross pressure controller, and thence to the mixer where the chemicals are applied. The mixing channels comprise a basin 48 feet square and 11 feet deep, with four passes of the water through the length of the chamber. The baffles are of the around-the-end type, spaced 12 inches apart in the first pass through the chamber, giving a velocity of 1.5 feet per second, and gradually reducing to a spacing of 24 inches, giving a velocity of less than 1 foot per second. The average alum dose in the mixing chamber is 0.9-grain per gallon. Lime is solely used for increasing the pH of the raw water, which is 7.0. The optimum pH for coagulation is 5.6 most of the time.

The water takes about 35 minutes to pass through the mixing channels, and then flows through two 30-inch pipes to the two coagulating basins.

The Coagulating Basins

By a cross-connection it is possible to use the coagulating basins in any type of flow. Each has a capacity of 1.25 million gallons, which gives a 6-hour retention period at a 10-million-gallon rate of flow. At the end of the first

section of the mixing chamber 12 feet of Filtros plates were set in the floor in concrete boxes to remove the tastes caused by algae through forced aeration, and this also raises the dissolved oxygen of the water. The air is furnished by a Nash Hytor 110-cubic-foot-per-minute blower.

The original plant has but one coagulating basin, a second being added in 1928. There are two 20-inch influent pipes to the old basin, which is 20 feet deep and 130 feet long by 60 feet wide. The influent is carried to the new basin by four 16-inch pipes, and this basin is 134 feet long, 72 feet wide and 16 feet deep. The influent is admitted to the basins behind stilling walls perforated with holes that are in the shape of the frustrum of a cone, 3½ inches in diameter on the influent side and 5 inches diameter on the delivery side. This raises the coefficient C to 0.90, reduces jet action and prevents the breaking-up of the floc. The holes are located only in the upper half of the stilling wall, and the total area of the holes is such that there is a loss of 1 inch of head, which results in an even distribution of the water as it flows through the wall and prevents short-circuiting in the basin. The rate of flow through the basin is about 1/3-foot per minute. The basins are so effective that the turbidity of the water going onto the filters is only 15 to 20.

Comparing the effectiveness of the two coagulating basins, it is found that the new basin, which has a depth of water of only 16 feet as compared with 20 feet for the old basin, is more efficient. This is aided by the directive action of the beams in the new basin, which still further aid the parallel flow.

The effluent from the coagulating basins flows out over a submerged weir 3 feet below the surface of the water, and thence to the filters through sets of pipes corresponding to the influent pipes in size and number for each basin.

The Rapid Sand Filters

There are two 30-inch headers for the filter influent serving the ten 24 x 16-foot filters with a capacity of 1 million gallons daily each. The operation of the filters is controlled throughout by hydraulically operated valves. Six of the units, the original installation, have air and low velocity water wash with strainer bottoms, 12 inches of gravel and 30 inches of sand of an effective size of 38 mm and a uniformity coefficient of 1.65.

The four filters installed by the American Water Softener Co. in 1928 have perforated grid bottoms, 18 inches of gravel, a 30-inch sand-bed and high-velocity water wash. There is a 24-inch rise of the sand-bed during washing with an expansion of 50 per cent. The effective size and uniformity coefficient are the same as for the sand in the old filters. The filters have cast iron wash-water troughs, which because of their small bulk reduce the wash-water velocity between troughs by about 15 per cent. The ten filters are equipped with Builders Iron Foundry rate-of-flow controllers, with direct-acting units on the new filters, and also Builders Iron loss-of-head and indicating and recording rate-of-flow gages.

Wash water is supplied by an elevated 50,000-gallon steel tank erected by the R. D. Cole Co. and filled from the clear well of the plant by one of two special pumps, a 700-gpm Worthington centrifugal or a 1,000-gpm DeLaval centrifugal pump. The wash water is metered with a Builders Iron Foundry venturi meter and a mercury manometer. There has been no loss of sand from the filters even after several years of operation.

The Clear Well and Chlorination

The filter effluent flows from the rate-of-flow controllers to a clear well of 2.5 million gallons capacity, 150 feet diameter and 20 feet deep. There is also a rectangular auxiliary clear well of 200,000 gallons capacity. Both clear wells are uncovered, but are protected from intrusion by stout fences, and a residual chlorine of 0.05 ppm is maintained across them as a safeguard.

Chlorine is applied to the filter effluents as they combine and enter the clear wells. The average dose applied by the Wallace & Tiernan MSV and MSA machines is 0.40 ppm.

Handling the Chemicals

The alum dosage, while averaging 0.9-grain per gallon, runs as high as 1.4 and as low as 0.4-grain per gallon. Lime for the final pH correction is applied to the filter effluent. To secure a pH of 8.3 in the filter effluent a dose of lime equal to about one-third the alum dose is required. Both the alum and the lime are solution feed.

The alum solution feed tanks are 6 x 7 x 7 feet and are agitated by hand. The solution is forced to the mixing channels by an ejector. The lime is continuously agitated in its tank by mechanically operated paddles, and is fed to the clear well by gravity. The chemicals are handled by a monorail trolley system from the storage bins to the solution tanks.

The plant is equipped with a complete laboratory for all necessary chemical, bacteriological and sanitary analyses and is operated under the direction of A. J. Smalshaf, Superintendent of Filtration. C. F. Jordan is Superintendent of Water Works.

The Public Treasury Speaks

By **R. E. SHERMAN**
Mayor of El Paso, Texas

I am the Public Treasury!

To me the people's revenues come and from me they are disbursed.

I am maintained by the patriotism and thrift of many thousands of citizens.

I am the keystone of government.

Without me the State could not function nor long exist.

Therefore I should be guarded and protected.

Waste is my ancient enemy, extravagance my deadly foe.

From the inroads of graft and greed keep me forever free.

Shield me from the pressure of selfish interests.

Protect me from administrative ineptitude and folly.

From the pliant and vacillating, as well as the conscienceless, ward me with watchful care.

Against the temptations of the weak and the cupidity of the strong guard me night and day.

From the wiles of the suave and influential and the raids of the wild, foolish or corrupt defend my walls and vaults.

At my doors place the twin sentinels of prudence and integrity.

Let honor be the armor and wisdom the shield of those to whom I am entrusted.

Mine is a public purpose; let it serve no merely private ends.

I am the Public Treasury; keep me safe.

County Zoning Progress in Wisconsin

By W. A. ROWLANDS
University of Wisconsin

THE county zoning movement promises to be one of the most significant forces in the development of rural Wisconsin. While this movement is now less than three years old, more than one-fourth of Wisconsin counties have already enacted or are in the process of enacting zoning ordinances. By the end of November of this year, it was estimated, eighteen counties would have finally enacted their zoning ordinances, which would mean that not less than five million acres of submarginal land would be closed to agricultural development. Manifestly, the magnitude and ultimate effect of such control have not as yet been fully realized. A beginning has been made, but a great deal more remains to be done in shaping the destiny of these large non-agricultural areas. It is doubtful, however, if any new movement has in its initial stages so generally won the support of Wisconsin people as has this distinctly rural zoning program.

In 1927 the Wisconsin Legislature assigned to an Interim Committee on Forestry and Public Lands the task of determining what might be done that would be helpful through later legislation. The 1929 report of this committee contained many constructive recommendations, most of which were enacted into law. The following citation from this report is noteworthy because it contains the first specific reference to zoning the marginal areas.

"Both the orderly development of northern Wisconsin, and the need for reducing expenditures because of tax delinquency, require that counties be given the authority to control development. Counties should have the right to give every possible aid in agricultural zones, with the aim of building up prosperous farming communities. But they should also have the right in sections of isolated farms, with heavy delinquency and numerous abandoned farms, to set such areas aside as forest and recreation zones, and be empowered to control the construction of more roads and schools."

From this vigorous presentation of the real needs in the way of regulatory power, the Legislature proceeded to amend the county zoning law (passed in 1923, designed for the areas adjacent to cities and under which both Milwaukee and Manitowoc Counties have enacted zoning ordinances) to include — ". . . and determine the areas within which agriculture, forestry and recreation may be conducted, the location of roads, schools . . . ." In brief, it was accepted by the Legislature of 1929 that the power to zone for agriculture, forestry and recreation would enable the distressed counties to limit local governmental costs and promote the best land uses.

Subsection (2) of the Wisconsin zoning law* provides that:

"If such county has a county park commission or rural planning board organized as provided by law, such commission or board shall recommend boundaries of such districts and appropriate regulations and restrictions to be imposed therein. The county park commission or rural planning board shall first formulate a tentative report and shall hold public hearings thereon before submitting a final report to the county board."

* Section 59.97, Wisconsin Statutes.

Relation Between State and County Agencies

In all cases, therefore, where such agencies exist, the responsibility for developing and sponsoring a zoning ordinance has been prescribed. Since, however, only a relatively few Wisconsin counties have established such park commissions or planning boards, it has been necessary to create a special committee of the county board to draft the tentative zoning ordinance and map and present a final report to the county board. However, these county committees, particularly in the cut-over regions of Wisconsin, have neither the technical skill nor the time to develop a complete and comprehensive zoning ordinance. Further, such committees have not sufficient funds to provide the necessary technical assistance. Consequently, no county board in Wisconsin has as yet attempted to enact a county zoning ordinance involving agriculture, forestry and recreation without first securing the cooperation and assistance of the interested state agencies. As a matter of fact, the procedure established in the first county zoning ordinance of this type has been systematically followed by all other counties.

This cooperation begins with a request that a representative of the Wisconsin Conservation Department or the University of Wisconsin present to the county board an explanation of how zoning may assist in promoting the financial and economic development of the county. All such explanations have culminated in a special resolution of the board requesting the assistance of the Wisconsin Conservation Department, the College of Agriculture and the Attorney General's Office in the development of a tentative zoning ordinance. These state agencies have been careful to see that all other state agencies in the field of policy-making or having administrative responsibility within such county were informed of the proposed ordinance before the ordinance was finally enacted. Especially is this true of the Wisconsin Regional Planning Committee.

Need for Careful Study of Conditions Preceding Zoning

It is plainly evident that much information is needed before anything like a satisfactory zoning ordinance can be drafted. County boards and particularly county zoning committees have recognized this fact in their preliminary resolution requesting state cooperation. A full knowledge of the tax problems throughout the area to be zoned, of roads and schools costs per capita, of agricultural development, and of the trend in forest and recreation land use is important to an understanding of the need for the ordinance, and facilitates the preparation of an ordinance which will stand the "test of reasonableness." For several years the University of Wisconsin in cooperation with a number of state departments has made special land and taxation studies of many north and central Wisconsin counties, which were available when zoning began in the fall of 1932. Without the maps and materials con-

tained in such studies the enactment of county zoning ordinances in Wisconsin would have been much more difficult and expensive.

Counties zoning for the three land uses—agriculture, forestry and recreation—have established three separate zones or districts: (1) a forestry district prohibiting agriculture and all uses involving year-long residence, but permitting forestry and seasonal recreation; (2) a recreational district permitting forestry and all forms of recreation including year-long residence, but prohibiting agriculture; (3) the unrestricted district with no restrictions on land use. So far, nine counties have all three zones, and nine have set aside merely the forest district and the unrestricted district.

In determining the boundaries of restricted use districts, county committees and town residents are often confronted with descriptions of land which have a high agricultural quality of soil and yet are located in an isolated area completely surrounded by non-agricultural lands. Obviously, from soils considerations alone, these lands would be classed as agricultural lands, *but in Wisconsin it has been accepted that an agricultural quality of soil alone does not constitute agricultural land.* In such cases, considerations of governmental economy and the interest of the public welfare must always be weighed against the purely technical aspects of the desirability of such land for agricultural purposes.

The question at once comes up: "If the private owner in a restricted district is prohibited from using his land for farming, is he not deprived of all income and yet required to pay taxes?" The permitted and alternative use is seasonal recreation and forestry. The latter use is encouraged and stimulated by the Forest Crop Law on the land suitable for commercial forest production. As F. G. Wilson and F. B. Trenk have pointed out (in the *Journal of Forestry* for November, 1933): "Forestry, because it can function with a minimum of dependence upon local governmental services, and therefore does not contribute to the acuteness of the very problem zoning is designed to alleviate, must be for many years to come a preferred enterprise in the restricted land use districts."

The Home Rule Features of the Wisconsin Zoning Law

Subsection (1) of section 59.97, Wisconsin Statutes, provides that:

". . . . the said county board shall before it adopts such ordinance or ordinances, submit the same to the town board or town boards of the town or towns in which may be situated any lands affected by such ordinance, and thereupon obtain the approval of said town board or town boards, so far as the same affects the lands in such town or towns, and in like manner any and all ordinances, which may amend any ordinance, which have been adopted as herein provided, shall be submitted to the said town board, and their approval obtained before the same shall be adopted by the county board. Such ordinance or amendments thereto may be adopted as to such town or towns which shall have given their approval thereto."

Much discussion has centered around this feature of the state zoning law. To some the necessity for securing final approval of the boundaries of the restricted areas from the town board seems unreasonable and a definite barrier to the establishment of broader and more comprehensive policies of land utilization.

It is significant to note that while educational meetings were held in some 250 Wisconsin towns, only nine such towns have finally decided to refuse the proposals made by the county zoning committee with respect to establishing restricted use districts. There is provision within the Wisconsin zoning law itself for partial solution of this problem.

Subsection (6) provides that: "The county board may by ordinance zone any lands owned by the county without the necessity of securing the approval of the town boards of the towns wherein such lands are situated and without following the procedure outlined in subsection (2)."*

In all cases, therefore, where county-owned land is concerned, the county may eliminate the necessity of securing town board approval. Further, subsection (2a) of the Wisconsin zoning law provides that: "When any county acquires lands by tax deeds, the county board may exchange any such lands for other lands in the county for the purpose of promoting the regulation and restriction of agricultural and forestry lands."

This feature of exchange of lands promises to be of considerable importance. There are many notable cases where private owners of land, the counties, and the state have exchanged lands to the mutual advantage of each agency involved in the transaction.

Creating an Enlightened Public Opinion

The established procedure has been to hold a series of educational meetings in all communities in the county. Any attempt to escape the task of carrying the message to the people will inevitably result in a suspicion of ulterior motives. City planners recognize that the planner must collaborate with the community at every step of the procedure. If this is true for an urban community where control over an individual's life is an every-day affair, it is a hundred times more important in a rural community on the "pioneer fringe" with its tradition of "rugged individualism." In addition to these town educational meetings, a special series of four articles was prepared for the county newspapers and was timed to precede the town meetings. Further, a series of radio talks covering the broader aspects of zoning and land use in Wisconsin was presented over the state radio stations.

As a result of these efforts to create an enlightened public opinion there is now strong local demand to correct past mistakes of unregulated and uncontrolled development by relocating isolated settlers and grouping them in established agricultural communities. Such grouping will reduce the miles of road per farm and the cost of education per child and thereby relieve the local taxpayer of an unbearable and unnecessary burden.

By officially attaching a destiny to the lands in the several use districts, these Wisconsin counties are now in a position to apply special plans for their development. Until we come to this stage of planning, zoning seems to be all negative, prohibitive and restrictive. Actually, it provides a firm foundation for a controlled and orderly development of natural resources for their highest use.

—From a paper read before the National Conference on City Planning, in St. Louis, October 23, 1934.

* In many states the county is the smallest unit of government. In Wisconsin and several other states there are smaller political subdivisions known as towns or townships which are interrelated with the county in their governmental functions, and both units are in turn interlocked with the state, especially through the state aids.

Aeration and Filtration of a Deep-Well Water Supply

THE LOW-PRESSURE PUMPING STATION OF THE HATTIESBURG, MISSISSIPPI, WATER WORKS

HATTIESBURG, MISS., has shown an admirable amount of forethought in the planning of its municipal water supply. For a city of its size, it has already planned for the future in the plant completed only three years ago. It has space in all its new buildings for the additional units which may be needed, even space for a duplicate diesel engine in case the city decides to provide its own power for lighting as well as for the operation of its water-works pumps at some future date. Then there is an extra-deep well that is running continuously and is turned into a delightful swimming pool on the edge of the city. The overflow from the swimming pool goes to a series of fish ponds arched by wooden bridges.

The 45-acre plot where the ten deep wells are located is about three miles from the center of the city in a low river-bottom area. The wells are all 10-inch diameter with six driven to the 600-foot water stratum and four to the 400-foot stratum. All but two of the wells are artesian and flow direct to the collecting basin at the low-lift pumping station. The other two are pumped by Kimball 1,000-gpm deep-well pumps. The collecting reservoir has a capacity of 260,000 gallons in two equal parts.

The Low-Lift Pumping Station

The low-lift pumping station is an attractive structure of red fiber brick on the outside and mottled yellow brick inside. The floors are of concrete and built with adequate protection against floods, which occur in the spring in this river-bottom area. The low-lift pumping equipment located in the basement of the pumping station, where it is self-priming, consists of two 2,000-gpm Worthington centrifugal pumps and one 1,000-gpm Worthington. These pumps deliver the water to the aerators on a hill about 1,300 feet distant through a 14-inch cast iron main.

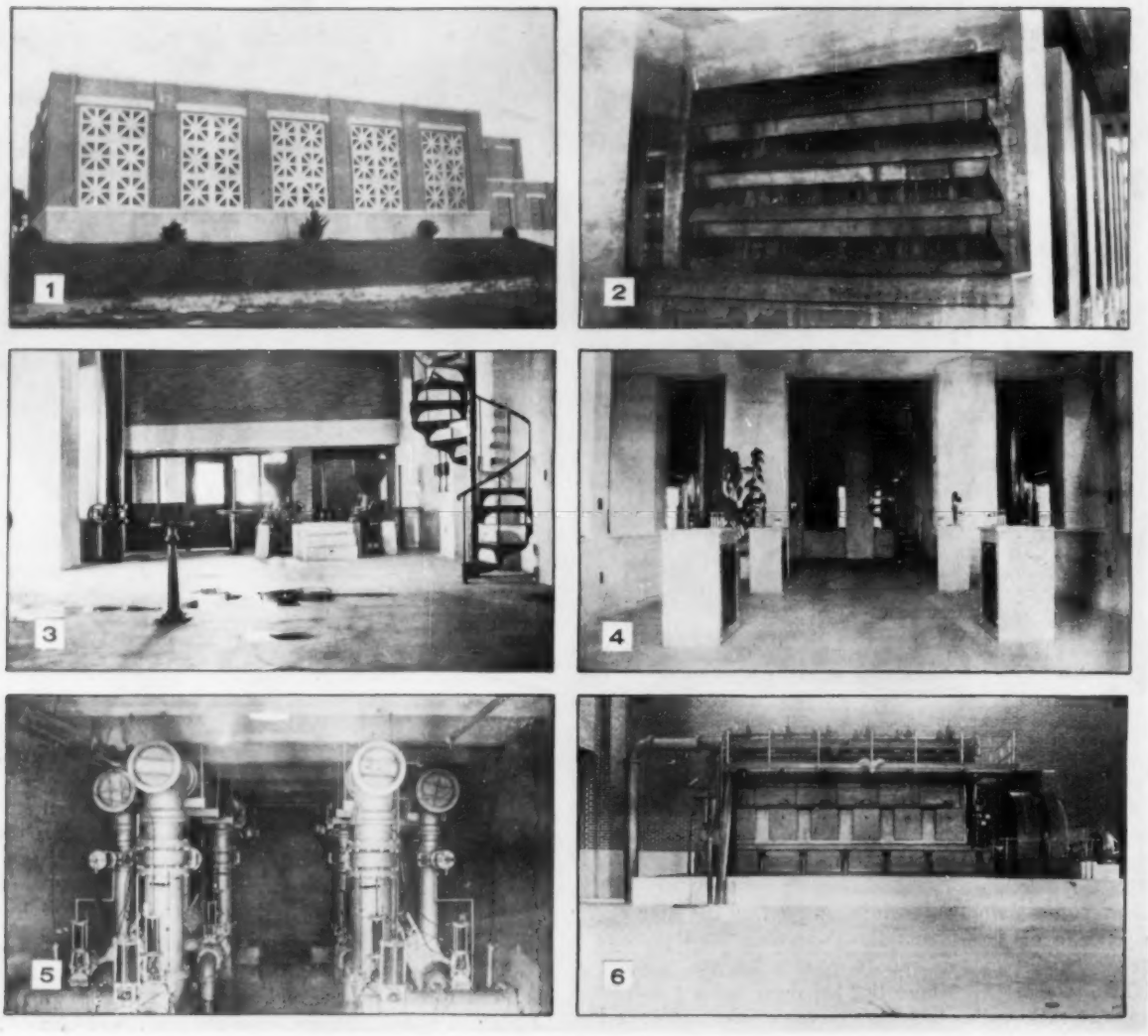
Power for pumping is provided through a transformer bank in the pumping station. The Mississippi Power Co. furnishes the power at 11,000 volts transformed to 2,300 volts at the pumping station. Because of severe thunderstorms, the power may be off at times of need, so that a 6-cylinder Fulton diesel engine operating on 4 cycles and with air injection furnishes 750 hp to drive a General Electric 500-kw generator for emergency power. This unit is sufficient to carry the entire load of both low-pressure and high-pressure pumps. There is also space in this station for a duplicate of this engine in case the city should decide to furnish its own power without recourse to outside transmission lines.

The auxiliaries in the station include a 2-ton Maris wall crane for handling pump casings, and the diesel cylinders for repairs. A 16,000-gallon fuel oil storage tank is located behind the pumping station in the well-kept grounds. A De la Vergne oil reclaimer is located in the station next a Rix air compressor for emergency furnishing of starting air for the diesel engine, which is turned over every week so that it will be ready for instant service.

The High-Level Station

The high-level station, which was placed in operation with the low-level station in October, 1931, contains the aerator, filters, pumps and reservoir. This station is on a plateau about 81 feet above the business section of the city and overlooks the State Teachers College. The city's population of 18,000 consumes an average of 2.5 million gallons daily, with a maximum of 3.5 million gallons during the hottest weather.

The aerator building, which measures 36 x 70 feet in plan, is of brick construction with fourteen large louvres of limestone, which make an attractive appearance and are effective in providing ample ventilation for the aerators. There are two batteries of aerators within the building, with seven units in each. The water flows up through a central well at one end of the building and thence through a top flume and to lateral open flumes which form the top sections of the aerators. The top section has a copper bottom with ⅛-inch holes on 1-inch centers, through which the water trickles onto five successive trays of coke. Each tray is of concrete, made so as to be removable, but the weight of the trays rather prevents this without special equipment. The coke is supported on the trays by heavy copper screening of about ¾-inch mesh. The large pieces of coke, averaging better than two-fisted in size, have not been changed since the plant was placed in operation, but are hosed off to remove the accumulation of iron at regular intervals when the lower flume is also cleaned out. A considerable amount of hydrogen sulphide is also liberated during aeration, completely removing



OPERATING VIEWS OF THE HATTIESBURG WATER WORKS

1. Side view of the aerator building, with the filter building in the right background. 2. Interior of the aerator building. 3. The chemical feed machines. 4. The filter control. 5. The pipe gallery and filter valves. 6. The 6-cylinder 750-hp Fulton diesel engine and 500-kw General Electric generator at the low-pressure pumping station, for standby power service

any trace of the gas in the water as delivered.

The aerated water flows by gravity to the four filters of 1 mgd capacity each. The rate-of-flow controllers and other equipment for the filters were furnished by the International Filter Co. The underdrains are perforated cast iron pipe of 3 inches diameter for the laterals, and with slotted concrete blocks between the pipe laterals. The graded gravel bed is 18 inches thick, with 30 inches of sand on top and 18 inches from the top of the sand to the top of the wash-water troughs. There is a constant head of 2 feet of water over the sand. There are two filters not yet equipped for service. Wash water is supplied from two 26,000-gallon tanks on the top floor of the building. Washing of the filters is required about every 36 hours of operation. When the plant was started, it was thought that it would be necessary to coagulate with lime and alum for the removal of the iron after areation, but the aeration through the coke beds has been so effective that the two International chemical dry feed machines have not been used since the test period. Similarly, a Wallace & Tiernan solution feed chlorinator was installed but has not been used since the two 20-inch mains to town were thoroughly sterilized before being placed in service.

The pumping station, in the same building with the filters, contains two 3,000-gpm Worthington centrifugal pumps direct-connected to Westinghouse motors, and one 1,500-gpm unit with space for another large unit when conditions require its installation. There are two 20-inch mains leading from the pumping station to the city, and each carries a Simplex venturi meter. The average pressure at the high-pressure pumping station is 35 pounds, and in the city 65 pounds. When a fire alarm is received, the pressure is increased to 90 pounds in the city. The pumping station is equipped with another 2-ton Maris crane for handling pump casings. About 75 per cent of the city can be supplied with water, without pumping, from the 5-million-gallon clear-water reservoir.

This plant was designed by Thomas H. Allen, of Memphis, Tenn., and is operated by John L. Arledge, Superintendent.

Fast Concreting of Street-Railway Tracks

Brooklyn-Manhattan Transit Corporation Re-opens Service in Heavy-Traffic District on Schedule

IN the heart of the shopping district of Brooklyn, N. Y., it was necessary for the Brooklyn-Manhattan Transit Corporation, operating both subway and surface car lines in the boroughs of Brooklyn and Manhattan, to remove 1,600 feet of track and the concrete which encased it, lay and weld new track, and pour concrete below and around the new rails. The work was located on Livingston Street from Nevins Street to Elm Place, and a number of large department stores had entrances on Livingston Street.

Because Saturday, August 25, was the last day of the season on which the department stores were closed all day, it was decided to start the work of tearing out the old pavement and rails on Friday, August 24, at 8:00 P. M. The original schedule called for the placing of the new concrete starting at 6:00 P. M., Saturday, August 25, and finishing at 5:00 A. M., Sunday, August 26. As the trolley service had to be resumed at 5:00 A. M., Monday, August 27, the Incor concrete would have had 24 hours to harden. There was considerable difficulty, however, in getting the old pavement and rails out, and the new rails in place and welded, so that it was found that the concrete could not be placed before 10:00 o'clock Sunday morning.

At 10:04 A. M., Sunday, August 26, the Central Concrete Mixing Corporation deposited the first load of transit-mixed concrete at the Nevins Street intersection. Work continued without let-up until the last batch of concrete was placed at 7:40 P. M. that night, a total of 500 yards of concrete in place in 9 hours and 36 minutes. At 5:00 A. M., Monday, the first car passed over the new rails on schedule, just 9 hours and 20 minutes after the last batch of concrete was placed. At the Nevins Street intersection 2-inch planks were placed between the rails, and at 8:15 P. M. just 10 hours after concreting started, Nevins Street was opened to the heavy automobile traffic coming from Manhattan Bridge. This traffic, especially on Sunday nights, is extremely heavy, for it includes cars coming from Manhattan, Bronx and Westchester County returning to Brooklyn and Long Island.

The B.M.T. Corporation purchased the concrete from the Central Concrete Mixing Corporation of Brooklyn, and it was placed by the Nosworthy Contracting Co., of Brooklyn, which also did the excavating of the old pavement. The B.M.T. Corporation laid the tracks and welded them, and also vibrated the concrete with two vibrators manufactured by the International Steel Co. A stiffer mix could have been used with the vibrators, but as the time of placing was limited, the water ratio was governed by the workability of the concrete out of the mixer down the chute to the subgrade rather than the workability around the rails. Near the end of the job, when it was certain that the last of the concrete would have at least eight hours to harden, a stiffer mix was used. (See front cover.)

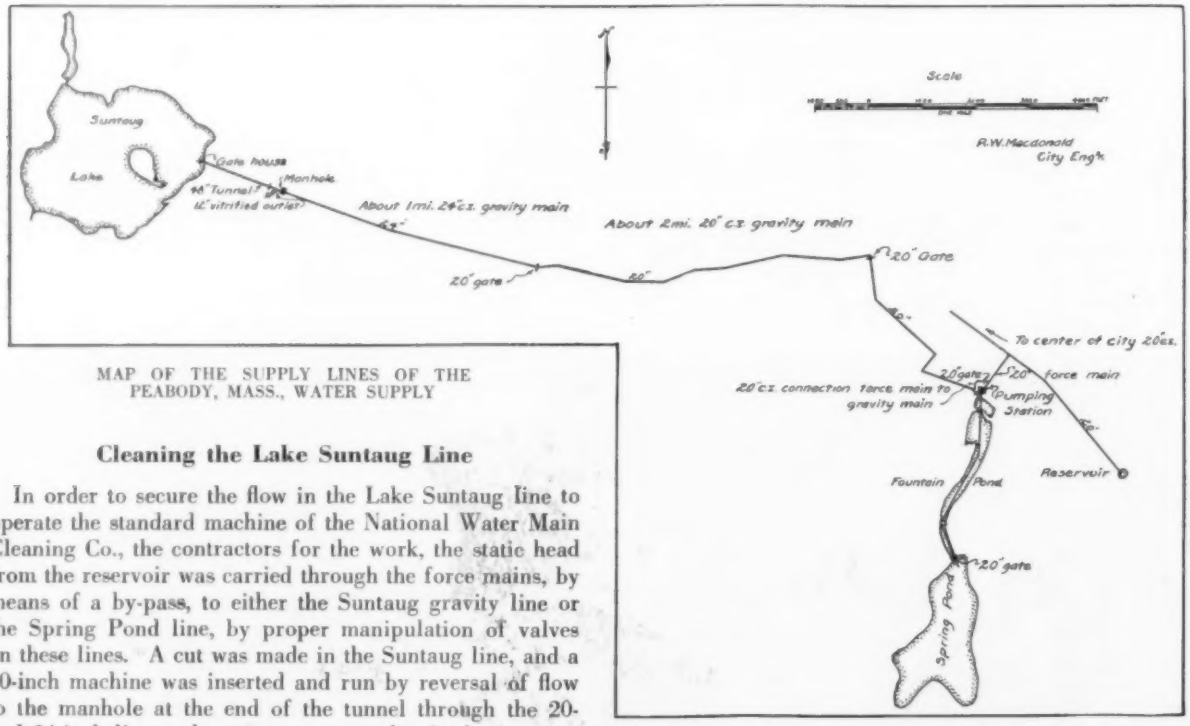
AT FIVE O'CLOCK, AS SHOWN BY THE ILLUMINATED CLOCK DIALS, THE FIRST STREET CAR WAS OPERATED OVER THE RAILS ON THE NEW CONCRETE BASE, LIVINGSTON STREET, BROOKLYN, N. Y.

Cleaning Reservoir Feeder Mains

Experiences in Peabody, Mass., Under Unusual Conditions

By **ROGER W. MACDONALD**
City Engineer, Peabody, Mass.

LAKE SUNTAUG, in Lynnfield, Mass., is the major source of water supply for the city of Peabody. Insufficient discharge through this 3-mile gravity supply line pointed to need for cleaning the line. The intake is through a 48-inch tunnel about ¼-mile long to a well from which one mile of 24-inch cast iron pipe reduced to 20-inch for the last two miles leads to the Spring Pond line 70 feet from the sump at the pumping station. Spring Pond, the secondary source for Peabody, is tapped by a 20-inch line 3,500 feet in length.



MAP OF THE SUPPLY LINES OF THE PEABODY, MASS., WATER SUPPLY

Cleaning the Lake Suntaug Line

In order to secure the flow in the Lake Suntaug line to operate the standard machine of the National Water Main Cleaning Co., the contractors for the work, the static head from the reservoir was carried through the force mains, by means of a by-pass, to either the Suntaug gravity line or the Spring Pond line, by proper manipulation of valves on these lines. A cut was made in the Suntaug line, and a 20-inch machine was inserted and run by reversal of flow to the manhole at the end of the tunnel through the 20- and 24-inch lines, where it was removed. At the junction of the 20- and 24-inch lines a 24-inch machine was inserted to clean the 24-inch main. The manhole has a 12-inch blow-off in the bottom, which was opened to remove the water and sediment.

The Spring Pond Line Was Different

While the cleaning of the Suntaug line was a routine procedure for the contractors, the Spring Pond line offered many problems which called upon the experience and ingenuity of the company to solve them satisfactorily. The Suntaug line enters the Spring Pond line about 70 feet from the pump well, and the line to Spring Pond is about 3,500 feet long. This pond is used chiefly as storage.

The pump well was shut off and unwatered by a 6-inch centrifugal pump. A 20-inch National cleaning machine was inserted in the line and jacked the 70 feet to the junction of the Suntaug line. As the pump well is only 27 feet 8 inches long by 6 feet 6 inches wide, there was not much space in which to work. Because of the limited space, a 2-foot screw-jack operated by four men with a long lever was used. It was hard work, for the entire accumulation of tubercles had to be pushed ahead of the machine and not flushed ahead, as is the case with normal operation by water pressure behind the machine.

All preparatory work for the cleaning was done Saturday afternoon and night, and the actual cleaning was done on Sunday, when the mills were closed and the demand for water was at the minimum. Before the lines were shut off, the reservoir was filled to capacity to care for the demands of the city and possible fire needs. It required between five and six hours to jack the machine the 70 feet to the junction, and then with the static head of the city reservoir behind it the machine cleaned the entire 3,500 feet of 20-inch line to Spring Pond in about fifteen minutes.

The inflow end of the Spring Pond line, where the machine emerged from the line, is 30 feet beneath the water level and rests on a pile cribbing. In order to be able to recover the machine quickly, a 100-foot length of sash

cord was threaded through an eye-bolt at the rear end of the machine and to a screw-eye in a 10-inch cube of wood with rounded corners. When the machine emerged from the line into Spring Pond, there was a geyser of very dirty water thrown above the surface of the pond with the 10-inch block floating on top. As the machine weighs about 450 pounds, it would have been impossible to raise it readily with the sash cord, so a chain was tied to the sash cord and reeved through the eye-bolt of the machine for lifting. As the machine emerged from the line about 200 feet from shore, the work of retrieving the machine had to be carried on from a rowboat. One end of the chain was attached to the front and the other to the rear of the rowboat, a "cat claw" was attached to the two chains to hold them together and a chain falls attached to the double chain to raise the machine sufficiently to clear the cribbing before the machine could be towed in to shore. When the machine was in about 15 feet of water it was pulled in the remainder of the distance along the bottom of the pond.

This water-main cleaning contract was performed for the city of Peabody by the National Water Main Cleaning Co., under the direction of Joseph B. Connors, Superintendent.

Public Utilities Regulation Has Not Been Tried

By WILLIAM A. ROBERTS
Peoples' Council, Public Service Commission, District of Columbia

EXCLUDING charges of corruption, allegations of favoritism to utilities constitute the most familiar political campaign material. Out of the incessant attacks upon administrative officials attributed to this cause there has grown a belief which has very substantial public support to the effect that the regulation of public utilities is futile and ineffective and that another remedy by way of public ownership or direct control through legislative action must be found. I do not dispute the advisability of public investment and control of utility properties. In many instances economies can be effected and more satisfactory service had than is possible under private management. However, I believe we must recognize the fact that approximately 92 per cent of all the power in the country and an even greater percentage of all the telephone messages are furnished by privately owned and privately operated public utility corporations. It is not likely that funds from public sources can be found with which to absorb this stupendous investment in capital, estimated to exceed fifty billion dollars, without a revolutionary change in our form of government.

It is appropriate, therefore, that we consider the justice of the claim that regulation has failed. I recently heard an important member of a Federal commission state that at the time of his appointment to a very technical position he was utterly ignorant of the extent or mechanics of the industry which he was to regulate and was without knowledge of any of the principles of regulation. The still more important official who was making the appointment is said to have stated that this constituted an excellent endorsement.

Wrong Kind of Commissioners

In some of the states the salaries of utilities commissioners do not warrant full-time employment of even mediocre men, with the result that the commissioners are selected from the ranks of those who have substantial commercial or professional interests hostile to certain of the petitioners appearing before their commissions. In other states appointment to the public service commissions is looked upon as a reward for political loyalty and an opportunity to compel political contributions. These situations are not by any means in the majority. Only too often the appointee is selected as the only individual who will accept the position and who is not tarred with the political stick of corporate affiliation. Worse than being corrupt, he is incapable and in an unobtrusive way smothers the demands of the public beneath a blanket of confusion and delay

The most vicious of all defects of the regulatory system has been a misconception of the cost of regulation. The administrative commission must first investigate and ascertain the lawful procedure and must then promulgate and defend satisfactory regulations, in addition to which it must supervise the execution of its regulations and continuously hear complaints and objections as to their operation. Appropriations made might be sufficient for the legislative function of investigation and promulgation of regulations, but the funds provided are inadequate to permit full executive function, which is the most important of all duties of a regulatory commission.

The unsound standard of reductions of rates is the only test popularly applied in ascertaining the effectiveness of a regulatory body, but it may be that in a given locality the rates are for the time being not only fair but actually inadequate. In such an instance the commission cannot be deemed to have failed because it does not immediately obtain a rate reduction. Granted that in most cases which attract public attention rate reductions should be made, there are still other duties to which the commission must attend.

I direct your attention to the unfortunate condition with respect to interstate carriage by motor vehicles. If there is one among you who has not received many complaints as to the loss and damage of goods, irregularity of schedules, irresponsibility for personal injuries and violent discriminations in operation of the motor-bus and truck industry as a whole, I should expect to discover that his home was located in the middle of the Canadian forests. It cannot be said that the public has gained as a whole by reason of the fact that the best bargainer can obtain rates

one-half or one-third of those paid by other users of interstate trucks. On the contrary, the greatest satisfaction exists where the states or the truckers themselves, by methods of doubtful legality, have forced a measure of self-regulation and of uniformity of rates and service. My point is that in the unregulated public utilities there is still evidence of discrimination which is decidedly irritating to commerce, whereas in the regulated industries allegations of discrimination have in large measure disappeared because of the effectiveness of commission action.

Affiliate Private and Public Operation

There can be no doubt that public authority, when owning and operating public service enterprises, should be relieved of many of the burdens imposed in order to counteract avarice inseparable from private operation. But the local publicly owned utility is itself susceptible to the pressure of voting majorities and to the possibility that unfair discrimination in rates and in service will arise. The relation of the local utility with the state and with other utilities demands that machinery for review of its activities should be established. It is imperative that this regulatory organization be impartial as between public and private ownership. Otherwise, publicly owned projects might be hampered and abused under the guise of regulation to the advantage of private enterprise, and private enterprise might be retarded in the exercise of its one advantage, progressive self-interest, to the disadvantage of consumers whom it serves.

More important than the interrelationship of public and private operation is the advantage to public operation of the diffusion of knowledge as to operating costs and conditions made public by uniform statistics compiled and audited by central regulatory bodies. There must also be considered the economies of the cooperative planning of joint facilities for the transmission of electric current, water, gas or communications, sponsored and controlled by a central governmental agency. The Grid system of Great Britain, with its affiliations of private and public operation, is an example of teamwork under central supervision which will have tremendous influence in this country as publicly owned enterprises develop.

In all of the major utility rate cases the commission involved commences an investigation either on complaint or on its own initiative. The commission engages its experts and other employees, directs the investigation, and summarizes the information.

It then, to use a simile, turns its face to the back-drop on the regulatory stage, dons a beard, and confronting the supposedly strange members of the staff, is supposed to be an unbiased judicial body. It is this game of "make-believe we're judges" which prolongs hearings and drives government counsel to early graves or more simple and lucrative rôles as company lawyers.

I have conceded that in the past many public utilities commissioners were poorly qualified, ineffective, political jobholders. I have been employed in city, state and Federal regulatory bodies all my adult life, and I have never known personally of an instance in which a commissioner accepted money for a corrupt act. I have served as president of the national organization of Federal lawyers, and have never known personally a government attorney who could be bribed. There may be such men but I have never known them.

My point is that meager salaries, constant overwork, and inadequate clerical staffs and facilities tend toward a timid, uncertain attitude that approaches cowardice in meeting the aggressive and fully equipped staffs of the large utilities.

As to the remedy, I suggest that only the costs attributable to the services of state or Federal commissions in *general* public matters be paid from appropriations and that all other costs of regulations be levied pro rata on the utilities, based on gross receipts as to state-wide matters, and directly upon the utility concerned as to specific cases. I believe the costs incurred by cities or other local governmental units in rate proceedings should also be assessed against the utility concerned.

As public officials you should resent the allegation of failure on the part of the earliest function of government, the policing and regulation of the strong for the benefit of the entire group.

—Excerpts from an address at the Rochester convention of the American Society of Municipal Engineers, September, 1934.

Federal Emergency Deficit Not Feared

"THE Government may enlarge purchasing power through maintaining for a time a large Federal deficit, which may be created by reducing taxes as well as by increasing expenditures. Such a deficit for emergency purposes need not threaten our financial structure if accompanied by sound policies for increasing production and employment."

The foregoing quotation is from the recommendations of the Commission of Inquiry into National Policy in International Relations, in its 400-page report as published November 26 by the University of Minnesota Press. This point of view, so contrary to current, timorous, balance-the-budget propaganda, is the reasoned conclusion of the Commission:

Robert M. Hutchins, President, University of Chicago
William Tudor Gardiner, Chairman of the Board, Incorporated Investors, Boston
Carl L. Alsberg, Director of Food Research Institute, Stanford University
Isaiah Bowman, Director of the American Geographical Society of New York, Chairman of the National Research Council
Guy Stanton Ford, Dean of the Graduate School, University of Minnesota
Beardsley Ruml, Treasurer of R. H. Macy and Company, Inc., New York
Alfred H. Stone, Chairman of the Mississippi State Tax Commission
Alvin H. Hansen, Secretary to the Commission and Director of Research, Professor of Economics, University of Minnesota

From the chapter of the report devoted to "Reasons for the Recommendations," the following paragraphs are quoted:

"There appears to be no substantial basis for the alarm with which our unbalanced budget is viewed in certain quarters in finance and industry. The maintenance of a large deficit, as an emergency measure, is nowise dangerous to our financial structure; indeed, this policy is probably the only one which will permit that financial structure to be held together at all. If there are dangers, they are less great than those of any alternative program. Indeed, it may be true that serious effort to balance the budget at present would actually make the real deficit larger and more enduring—simply because of effects on business earnings, production, and employment. . . .

"The balancing of the Federal budget, and even a distinct unbalancing on the surplus side, will sometime—let us hope soon— become possible, and may actually be necessary for the avoidance of chaos. There is now enough money in circulation, and enough reserve in the banks, to permit a disastrous boom—if the velocity of circulation were to rise, and reserve ratios fall, to normal levels. *But it is doubtful whether the Federal budget can safely or wisely be balanced so long as business earnings, industrial output, and total employment remain at or near their present levels.* Indeed, the volume and trend of total employment may afford the best single guide for sound fiscal policy under present conditions."

Creek Straightened and Sewer Built

Open Sewer Eliminated in Cincinnati as a PWA Project

WORK was started on April 24, 1934, in Cincinnati, Ohio, on what is called the Mill Creek intercepter sewer, Federal Project 2709. This work involved the removing of an abrupt bend in the channel of Mill Creek and building a 7-foot 9-inch reinforced concrete sewer alongside the straightened stream for a distance of 8,320 feet. Mill Creek flows into the Ohio River and is a small but very active stream draining a considerable area. With the increase of industry through the valley, the stream had become practically an open sewer. The purpose of this project was to clear the creek of sewage contamination.

The contract for the project was let to the Torson Construction Co. on a bid of $375,030 and has recently been completed. On this work, as in constructing a similar reinforced concrete sewer for Louisville, Ky., in 1931, the contractor used a number of Link-Belt crawler gas cranes and draglines for excavating and rehandling dirt, for driving piles, and for general handling purposes. There were three 2-yard heavy-duty units, one handling unit and two smaller units on the job.

Handling the Concrete

A feature of the project was the delivery of concrete to the forms in the trench. Concrete from a batching plant several blocks away was delivered in transit-mix trucks to a side-discharge car hauled by a Plymouth gasoline locomotive over a narrow-gage railway which had been built along the full length of the project, to bring the concrete to the points where the forms were to be poured.

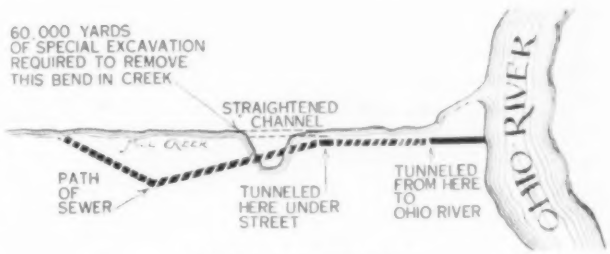
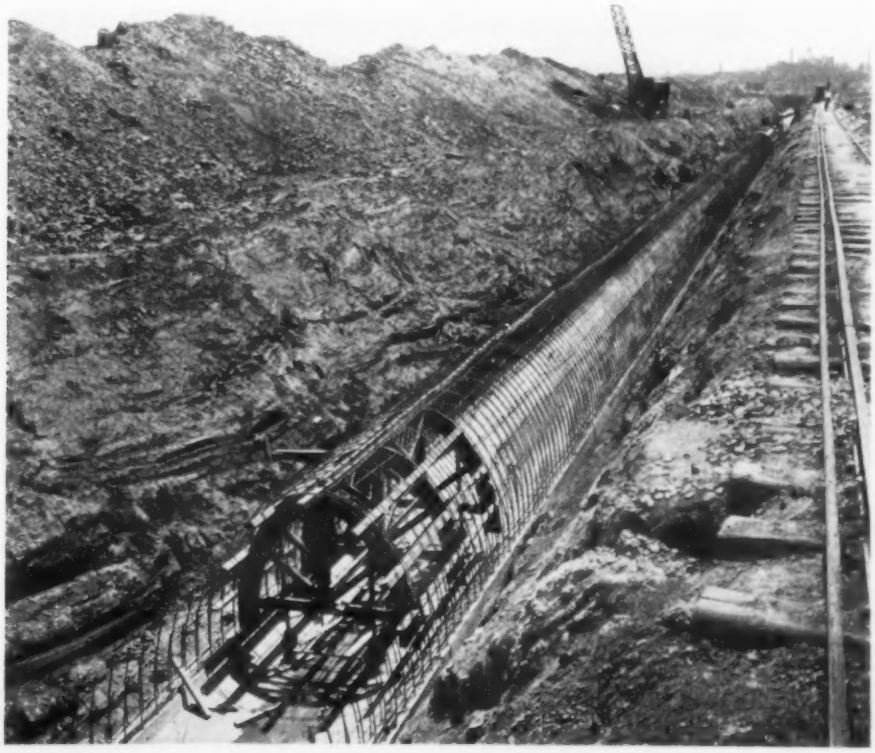


DIAGRAM OF THE WORK

The diagram shows Mill Creek is being straightened to eliminate an abrupt bend and to permit building the sewer straight through the project. The elimination of the bend in the creek entails 60,000 cubic yards of special excavation, which was handled with a dragline. The photograph shows a section of trench with the sewer wall reinforcing steel in place.

Hamilton County paid the city $500,000 for permission to use the city's Mill Creek intercepter sewer as an outlet for villages and subdivisions farther up the valley, which were included in County Sanitary Sewer Districts, with the understanding that the city would use as much of this sum as necessary to complete this section of the sewer. The County Sanitary Engineering Department handled the field engineering.



A SECTION OF THE SEWER, SHOWING THE PLACING OF REINFORCING STEEL

The Opportunities for Refuse Salvage in New York City

By ERNEST P. GOODRICH
Consulting Engineer, Formerly Commissioner of Sanitation, New York City

FROM time to time in New York City, under various commissioners, more or less intensive analyses were made of the municipal wastes included under the general term "refuse." Domestic, apartment house, office and industrial ashes are seasonal in quantity and also dependent upon weather conditions. This material, however, averages about 30 per cent of the total quantities handled. Under normal times, there is a market for good cinders at the source. Even during most of the year 1933, good cinders could be sold for 50 cents to $1.50 per load of about 5 yards. So-called clean ashes also had a market for land-fill.

Profit from Land-Fill

Whereas, under previous administrations, such fill had always been done without cost to the landowners, under the writer's régime a practice of charging was instituted, and a certain amount of revenue was thus derived at the rate of 50 cents a load. Much publicly owned property was also filled, naturally without such charge, and in certain other instances, agreements were entered into with private owners to fill their lands free of charge, where analysis showed that it would save the city at least 50 cents a load in haulage costs. That land-fill is profitable, in the long run, has been amply demonstrated by the Brooklyn Ash Removal Co., which bought swamp land at nominal prices, deposited municipal refuse thereon, even created an excellent golf course, and has recently agreed to sell approximately 300 acres to the city of New York for roughly $1,500,000. The fill was of such a character that the golf course had been constructed without special top-dressing, except on the greens. To make such fills advantageous for any real estate development which requires the growing of grass, shrubs and trees, a certain amount of garbage should be combined with the ashes. Special legislation was prepared and submitted to the proper authorities, designed to permit such mixing at the discretion of the Commissioner.

Other Salvageable Materials

While ash-fill has been indirectly lucrative in the past, the most valuable salvageable commodity has been waste paper of the various grades, bottles and other glass, rags and scrap metals. Tin cans pressed into compact blocks also brought good prices. When the writer first became connected with the Department of Sanitation, the income from these sources was only a few hundred dollars a week. After a careful study of the situation and by means of various temporary contracts with companies and individuals who were willing to pay for the privilege of salvaging these commodities, the income was built up within six months to approximately $3,000 a week. At certain times during 1933, the salvaging of paper was carried on by private individuals with push-carts so far as to restrict the Department collections, and difficulty was experienced during some weeks in securing enough combustible material to burn the garbage without smoke and odor. It is rumored that during profitable years, the income in the borough of Brooklyn alone from the sale of such salvaged materials aggregated over a million dollars. This was made possible because of the fact that the Brooklyn incinerators had all been provided with picking belts. Had all the other incinerators in the city been similarly equipped, it is possible that income in good years would amount to over $2,500,000.

It is interesting to relate in this connection that the character of Brooklyn paper salvage is such as to bring higher prices than can be secured from salvaged paper in other boroughs. It should also be noted that an indirect income accrued to the city in connection with the nominal fee paid by contractors at the waterfront dumps, because the agreement between them and the city required them to haul, wind and trim the scows. Had this arrangement not been in force, the city would have had to spend several hundred dollars weekly for the work.

Aside from the mixing of garbage with ashes to improve the character of land-fill, no efforts have lately been made in New York City to secure any salvage value from the garbage collected.

At one time a plant was built by a private contractor for the rendering of garbage; but so much protest was voiced, especially against the concentration of uncovered garbage scows in the vicinity of the plant, that this whole project was abandoned. Under the writer's direction, the whole question of salvage from this source was re-studied, and, among other things, it was found that the recovery of lost silverware would net a small income. Again, simply the removal of tin cans from the garbage, it was estimated, would increase the capacity of the incinerators from 10 to 15 per cent.

Plans for a Complete Salvage Plant

Drawings were prepared and a small cardboard model was constructed of a complete salvage plant, the end products of which might be ground chicken-feed or stock susceptible of conversion into fertilizer, or which could be mixed innocuously with ashes to constitute an unobjectionable fill. This latter process is followed in England to some extent. Studies were made of the possibility of disposing of the ground remnant of the garbage by depositing it in the sewers, where it would eventually be treated in connection with normal sewage sludge. It was felt that it might eventually be possible to require all householders, apartment houses, hotels and other sources of true garbage either to incinerate it individually or to install grinders which would mascerate the garbage so that it could be dumped directly into the sewers, through which it would be transported to the regular sewage disposal sites. After this latter idea had been fairly well developed in theory, it was found that practical experiments had already been carried out along this line in Lebanon, Pa., and Baltimore, Md., with much success.

De-Aired Paving Brick

By W. C. RUECKEL
Director of Research, National Paving Brick Association

AIR which fills the voids in clay particles is not entirely removed when the mass is kneaded into a plastic state, unless some form of de-airing is applied. Entrapped air is responsible for the laminae produced by the auger and die which are found in the finished product. Certainly any air present tends to destroy the continuity of the mass when formed, whether it be collected in strata or disseminated throughout the mass.

The de-airing chamber is usually located between the pug-mill and the auger machine. The pug-mill is a long trough through which runs a heavy revolving shaft equipped with a series of wide blades in which the pulverized shale or clay and water are mixed and kneaded into lumps of plastic material. When de-airing is accomplished, the lumps of clay are forced through a cone-shaped orifice which acts as a vacuum seal. The material being discharged from the orifice is shredded in an evacuated chamber. The shredded material, from which all air has been removed, is then consolidated by the action of an auger and extruded from a die with the required cross-section. The de-aired column then travels to the cutting table and is cut into brick sizes and handled in the usual manner. De-airing has been found to produce a heavier, more homogeneous product, which is also stronger and free from visible laminations. The increased weight of the de-aired brick has been found to range from 2 to 5 per cent in commercial practice.

Data on the properties of de-aired paving brick given in the table are from an Ohio State University bulletin.*

PAVERS MADE FROM NORMAL AND DE-AIRED CLAY

Ware	Weight of Ten Specimens (Lbs.)	Increase in Weight Due to Evacuation (Per Cent)	Absorption (Per Cent)	Rattler Loss (Per Cent)	Improvement Due to Evacuation (Per Cent)
Medium-fired Cleveland ware Unevacuated .	86.50		2.55	25.43	
Medium-fired Cleveland ware Evacuated	90.00	4.05	0.70	20.55	19.17
Light-fired Cleveland ware Unevacuated .	85.75		2.45	21.86	
Light-fired Cleveland ware Evacuated	89.00	3.25	0.26	16.85	22.97
Medium-fired Canton ware Unevacuated .	80.75		5.39	22.45	
Medium-fired Canton ware Evacuated	85.62	6.02	0.20	18.82	19.28

The decrease in absorption and rattler loss obtained by de-airing is particularly noteworthy. De-airing was also found to increase the transverse and crushing strength from 10 to 25 per cent, depending on the nature of the clay or shale used in making brick.

* "Effect of De-airing Stiff-Mud Bodies for Clay Products Manufacture." Bulletin 74, Engineering Experiment Station, Ohio State University, by J. O. Everhart, C. R. Austin and W. C. Rueckel.

Shade Tree Planting as a Relief Project

By FREDERICK W. KELSEY

ALL over the country unemployed men are being used on more or less important work relief projects, receiving out of the public funds usually a minimum wage for their work. There would seem to be one really important thing that they could be doing which would immediately improve the appearance of our cities and environs, and would year by year increase alike their beauty and value, and that is the planting of shade trees.

So far as the payment for the labor involved is concerned, emergency relief as at present constituted seems ideally appropriate for such a country-wide undertaking. As to the actual small cost of the trees for this improvement, a very large percentage of the cost goes directly for wages paid to workers in the nursery fields. Indeed, this might be a proper expense from the extremely large financial expenditures which are being made for the purpose of hastening recovery. If this were not considered practicable, however, it might be arranged that each property owner, in return for the added beauty immediately adjacent to his property, would be assessed some very small sum in proportion to the number of trees planted in front of his property.

The necessary legislation for such an assessment on property owners has already been passed in several states, and can and should be passed in every state in the Union. Its benefits have a far wider scope than a mere emergency measure. The result of a country-wide effort in this direction would do three things. First, it would give a definite objective to the relief works, whose "made work" is criticized as being largely wasteful in many cases. Second, it would materially benefit an important branch of agriculture, the nursery industry, which thus far has in no way been benefited by relief expenditures. This industry employs a very large group of hard-working men and represents a vast money investment all over the country. Third, the beautification of our streets and highways could be accomplished at small cost and would prove an investment continually increasing in value.

Of requisite legislation for municipal street tree planting improvements, in 1893 the writer drafted the original New Jersey Shade Tree Commission Act. Afterwards the law in substance was adopted in a number of other states. New Jersey has at present more than 125 and Pennsylvania alone more than 130 of these shade tree commissions, continuously carrying on improvements throughout the states. The New Jersey law soon became popular, as the home-rule provisions required the approval of the Act by the authorities of each city, town or borough throughout the state, and also required assessing on frontage owners the cost of the trees and tree planting and proper tree guards, as in the case of street paving, curbing, etc. Similar systems for uniform street tree planting have long been in successful operation in Europe.

In conclusion, it is suggested that in many municipalities throughout the United States it ought to be possible during 1935 to conduct systematic tree-planting campaigns, the labor to be made available from public works or relief funds, and the small cost of the trees themselves to be paid by voluntary contributions from the benefited property owners, or assessed against the property, as done under the Shade Tree Commission Act of New Jersey and other states.

Water vs. Fuel for Cheap Electric Power

National Resources Board Discusses Possibilities and Difficulties in the Development and Distribution of Hydroelectric Current

ONE of the objectives which national planning should strive to attain is to provide all sections of the country with all the electric power they may require at the lowest possible cost.

From the long-run viewpoint, the desirability of conserving natural resources makes the full utilization of all available water power seem highly desirable. Every unit of coal, gas, or oil burned is so much deducted from irreplaceable supplies. Water power, on the other hand, is a self-replenishing resource. Our rivers will continue to run so long as rains continue to fall and land surfaces are not worn down to a plain. No waste results from utilizing the power, and no harm is done if the power installations do not damage esthetic values. Indeed, the power of a running stream is lost every minute that it remains unharnessed, whereas a ton of coal not raised today is available for use tomorrow or the day after. Nor does the use of water to generate electricity harm it for drinking, or bathing, or transporting goods—coal, oil, and gas are destroyed by burning.

Short View or Long View

From the short-run commercial viewpoint, the comparative merits of water and fuels as sources of electric power wear a different complexion. By virtue of (1) the great improvements recently made in furnaces and engines; (2) the low prices prevailing at present for coal, gas, and oil; and (3) the possibility of building fuel-electric plants near the markets for current and yet where fuels can be delivered cheaply, it is commonly less costly to provide electricity by combustion methods than by harnessing water powers and building transmission lines.

No marked gains have been made in water power generation since the turbine wheel was perfected, for the simple reason that under favorable conditions, the turbine converts about 85 per cent of the energy of falling water into electricity—a percentage of conversion not approached even now by the most efficient of fuel-burning plants. Yet the advantage in cheapness lies decisively on the side of up-to-date coal, gas, or oil plants, when they are favorably located with reference to markets and fuel supply, provided that they can operate their furnaces continuously at an even rate. The great technical advantage of water-power plants is that they can be turned on for a few hours' work and then turned off again without much loss. Their place in the present technical scheme is mainly that of a supplementary source, used to carry peak loads for brief periods, while all of the load part of the time and the bulk of the load the rest of the time is carried by the economical fuel burners.

According to the 1932 census of electrical industries, 79 per cent of the total electric-generating capacity of the country is fuel-burning. The 21 per cent provided by hydroelectric plants comes from the water powers which, all things considered, have seemed most profitable to develop. As matters now stand, commercial enterprises seem unlikely to push the development of water power much further in the near future. It is estimated that not more than about one-sixth of the country's water power has been harnessed; but the remaining sites are mostly expensive to develop, distant from markets, unreliable in flow, or undesirable in some other respect from the strictly commercial viewpoint.

The value of a water-power project by itself depends upon what it can generate in times of low water or after a long drought. Even then it is necessary to draw down water impounded in the reservoirs, sometimes leaving flooded shore lines seriously exposed if not actually pestilential in order to get the last drop of power from the plant. In recent years the idea of using cheap off-peak power for pumping back water into the reservoir has in a sense made a power reservoir fill the roll of a storage battery, but even so it is increasingly evident that water power and steam power must, economically speaking, be developed so as to complement and supplement each other.

Government development of water power cannot overlook considerations of cost and return; but it can take a broader and a longer view of the returns than commercial companies can afford to take. The Government is concerned with the question of conserving fuel resources, touched upon above, in a fashion different from private business. Also, in developing water power the Government should reckon among the gains any social benefits that may accure to its citizens, though the benefits might yield no financial returns to a private company. Dams are erected in numerous cases to serve one or several purposes other than generating electricity; for example, to prevent floods, to prevent streams from running too low in dry seasons, to facilitate navigation, or to irrigate farming lands. Sometimes, though not always, the water stored behind these dams can be used for power without detriment to the chief purposes of the project. Under these circumstances, the capital cost properly attributable to the generating unit is not the cost of the whole undertaking, but merely the extra costs of installing generators and transmission lines. Then a power project which would have been unprofitable, considered purely on a commercial basis, may earn a satisfactory return upon the cost allocated to the generating unit.

Many Still Without Electricity

Another factor that Government must consider is the social desirability of supplying electricity to a larger number of people than now enjoy the great aid to life. It is not necessary to enlarge upon the benefits conferred by adequate lighting, or the easing of labor made possible by the many electrical devices that have been invented for the household, the farm, the community, and shop. Though our people are the world's greatest users of current, only 13 per cent of our 6,200,000 farms have electricity, whereas 64 per cent of the farms have automobiles. There are villages not reached by power lines, and over wide

areas the per-capita consumption of current is so low as to prove that the majority of families are doing without service though it is technically available. There is thus a vast potential demand that has not yet been tapped.

What keeps this potential demand from becoming effective are the relatively high charges for electricity that prevail in many sections. Recent studies of domestic consumption in low-cost municipalities demonstrate that the demand for current is highly elastic, expanding rapidly as the cost declines. The national average consumption of the United States was 604 kilowatt-hours in 1933. The average charge to consumers on October 1, 1934, for the whole country is reported as 5.49 cents per kilowatt-hour. In Seattle, where the average cost is 2.58 cents, the average consumption is 1,098 kilowatt-hours per capita. In Tacoma, the charge is 1.726 cents and the consumption 1,550. In 26 cities of Ontario, the average charge is 1.45 cents and the consumption 1,780. Finally, in Winnipeg, where the average net charge is only 8 mills per kilowatt-hour, the average per capita consumption exceeds 4,000 kilowatt-hours.

It thus seems fairly certain that, if the average costs to consumers were substantially reduced in this country, a great increase in consumption would follow. Of course, this increase in volume of sales would reduce substantially the overhead costs per kilowatt-hour. Because of the large investments in generating plants, transmission lines, and distributing systems on the one hand, and the moderate operating expenses on the other hand, overhead makes a far larger part of the total costs in electric-power utilities than in most industries. Doubling the use all but cuts the cost per unit in half.

The cost of serving a consumer includes the cost of generating, of transmitting, and of distributing current. Transmission refers to high-voltage lines which can carry the current long distances with relatively little loss; distribution lines start at "stepping-down stations" and carry current comparatively short distances at lower voltages to consumers. Reductions in cost of service may be effected at any of these three stages; but the stage of transmission, which ties together generation and distribution, seems to afford the best opening for systematic planning.

Why the Holding Company Should Be Economic

Experience indicates that marked economies are effected when interconnecting transmission lines are built to tie all the generating units and all the consumers of a wide area into one circuit. Without such lines, each generating unit and its market are isolated. The generating unit must provide for a peak load which is much higher than the average load. The interconnecting of many markets and many generating units makes it possible for the peak loads in different uses to offset one another in the course of 24 hours, so that the maximum peak load can be brought much nearer to total generating capacity than in the isolated unit. The total investment required for a given standard of service is thus greatly reduced by interconnection, and with the investment the necessary charge to consumers is also reduced.

Considerable progress has been made in this country toward the creation of such circuits. Particularly noteworthy are the networks in the Southeastern, New England, East Central, and Pacific Coast states. On January 1, 1933, according to the census, there were 58,000 miles of transmission line operating in circuits at 66,000 volts or over. But large districts are still without such advantages. For example, in an area extending from Keokuk and St. Louis to Detroit (including Chicago and Milwaukee), it is reported that the installed generating capacity is 4,585,000 kilowatts, of which only 66 per cent has been in use as measured by the maximum peak load. If 15 per cent of excess capacity is taken as necessary to sound operation, then 1,086,000 kilowatts of the present installed capacity would not be needed to carry the present peak loads, provided all the generating units were tied into a comprehensive system. This excess capacity is estimated to represent an investment of over $108,000,000. That sum is included in the capital upon which the utility companies now base their rates. Studies of comparable areas in Pennsylvania, New York, and New Jersey indicate excess generating capacity over maximum peak loads ranging from 30 to 37 per cent.

To sum up the outstanding factors which the Power Policy Committee has under consideration:

There are areas in the United States in which the power companies have excess capacity, in the sense that they cannot sell a large percentage of the power they can generate at the rates they charge. There are other areas, especially rural regions, which enjoy no electrical service.

Domestic and municipal consumption is at a level which indicates that a large part of our people go nearly or quite without the benefits which electricity brings to a family and a community. In this sense there exists a vast latent demand that is not being tapped at present.

The large per capita consumption in areas where the cost of current is low indicates that this potential demand would become effective if costs could be reduced.

In many areas interconnecting transmission lines would add greatly to the efficiency of operation and enable the companies to supply a much larger demand than at present without any additional investment. The critical question for such companies is whether the expansion in demand which might follow upon a reduction of rates would increase their net revenues.

The Government has an interest in extending the use of electricity as an increasingly significant item in the American standard of living. Hence it has an interest in the reduction of rates to stimulate consumption. It has a special interest in the development of hydroelectric plants as a means of conserving the country's resources in coal, gas, and oil. In some cases its plans for flood control, or other uses of water would enable it to provide hydroelectric power as a by-product at slight direct cost. The Government will not fail to consider as a factor in the total situation the large sums of capital actually invested by power companies. The critical questions for the Government are how far the elasticity of the demand for electricity and the economies produced by interconnecting transmission lines may make it possible to reconcile these seemingly conflicting interests, and, where reconcilation is not possible, which interests should be given preference.

EDITORIAL NOTE.—The foregoing observations are from the section on Hydroelectric Power of the report submitted to President Roosevelt on December 1 by the National Resources Board. At the end of this section of the report the Board states that it "awaits with lively interest the recommendations which the Power Policy Committee will lay before the President in due season." This committee is composed of Hon. Harold L. Ickes, Chairman; Morris L. Cooke, Robert E. Healy, David Lilienthal, Major General Markham, F. R. McNinch, Elwood Mead, T. W. Norcross.

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

City Manager Plan for Toledo

Charter Commission for Lucas County

TOLEDO, OHIO.—Two very important forward steps in municipal and county government were taken by the voters of the city of Toledo and the county of Lucas in the general election held November 6, 1934.

The program of work of The Toledo Chamber of Commerce adopted in 1926 contained, among other important items, the following proposal: "Investigate the advantages claimed for the city manager plan of municipal government, with small council elected at large." A representative committee was appointed to study this question and report to the Chamber membership. A favorable recommendation resulted in the formation of an independent city manager plan association, thoroughly representative of all the elements of the city. Two attempts were made, one in 1928 and one in 1932, to secure passage by the voters of a city manager form of government for Toledo. Another attempt in 1934 succeeded, and, effective January 1, 1936, this city will have a city manager, with a council of nine, elected at large by proportional representation.

Students of government and citizens generally in Ohio have for many years felt the desirability of making county government modern and more efficient. The aims of various groups ranged from consolidation of essential functions of city and county government to complete consolidation of city and county, particularly in the larger urban counties. An amendment to the constitution was found necessary before any progress could be made. Various groups throughout the state, interested in this movement over a period of years, prepared a suitable amendment. The Legislature being dominantly rural, it was difficult to secure action, and decision was made to place the matter on the ballot through initiated petition, as is permitted by Ohio laws.

The Toledo Chamber took an active part in the framing of the original amendment and assumed the initiative in securing signatures to petitions in Lucas County. With the assistance of the League of Women Voters, nearly double the quota was secured. Promotional work was carried on by the Chamber to bring about the passage of the amendment in 1933, the vote in Lucas County being 61,484 for and 19,867 against.

At the November, 1934, election, the voters of the county voted favorably on the question, "Shall a County Charter Commission Be Chosen?" and at the same time elected 15 charter commissioners. In order to make the election representative, the Chamber's Committee made a selection of thirty candidates, and secured the required number of signatures to petitions to put these names on the ballot. No other names were suggested and the Commission as it now stands is composed of five representatives of business, all residing outside the city limits of Toledo; three representatives of the educational field; three gentlemen farmers; the President of The Toledo Central Labor Union; the President of the Street Car Men's Union; one attorney, and one physician.

The new Commission has just held its first meeting and, pending the time when funds may be appropriated for the selection of an executive secretary, the undersigned is acting as Secretary to the Commission. The Commission must submit a charter to the voters of the county at the November, 1935, election.

A. J. HORN,
Secretary, The Toledo Chamber of Commerce.

City-County Consolidation for Milwaukee

BY an overwhelming majority the voters in the city and county of Milwaukee on November 6 voted in favor of city-county consolidation in that area in two advisory referenda.

The following question was submitted to the voters of the city of Milwaukee:

Do you favor changes in the law which will make one officer elected in each assembly district in the city of Milwaukee the representative of said district on both the County Board of Supervisors of Milwaukee County and the Common Council of the city of Milwaukee?

An additional question, as follows, was submitted to both city and county voters:

Do you favor effecting by such county board, or legislative action or amendment to the state constitution as may be necessary, consolidation of municipal services and governments in Milwaukee County?

The cities of Milwaukee, West Allis, and Cudahy, and the county as a whole, voted in favor of consolidation. This vote was expected in Milwaukee City, but the action of the voters in West Allis and Cudahy came as a surprise. As was to be expected, most of the suburbs voted decisively against the proposal, although in a few of these areas the vote was close.

The question of city-county consolidation in this area had been agitated as early as 1906. During 1934 the problem was actively pressed. As a result, in the early part of the year the County Board and the Common Council appointed a Joint Committe on Consolidation in Milwaukee County, composed of thirty citizens, headed by John Doerfler, a former Soicalist alderman. The committee included Frank E. Baker, President of the Milwaukee State Teachers' College, and Henry Ohl, President of the State Federation of Labor. Richard E. Krug, Municipal Reference Librarian, acted as secretary. At the request of this committee, the advisory referenda were placed on the ballot. Neither is binding upon the regular legislative bodies. Future action will be determined by the local boards, the State Legislature, and the voters of the entire state.

Through October and early November the Joint Committee issued interesting reports on the maze of overlapping governmental units in the Milwaukee area. This section embodies 93 taxing units, including 64 common school districts, 5 city school districts, 5 vocational school districts, 5 cities, 5 villages, 7 towns (townships), 1 county, and a metropolitan sewage district. These units elect 464 public officials, who in turn appoint and employ 13,000 workers. Eighteen county board members are elected from the same territory that elects twenty-seven aldermen of the city.

Elections in the county are in charge of 83 independent units. There are 17 independent assessment departments. The voters elect 82 local public treasurers. Eleven agencies have a hand in collecting and distributing public money. At the same time, the city of Milwaukee has enough mechanical apparatus in treasury work to care for the entire county.

Milwaukee County's 55 parks are in the hands of 7 different overlapping governments. The development of the lake front is in the control of four separate governments. The city operates three parks in the county outside the city limits, and the county operates three parks inside the city of Milwaukee. The latter operates a park in the village of Fox Point. Duplication of expensive machinery is evident. The Joint Committee pointed to the need for a unified park police system.

There are eleven fire departments, a large number of separate police services, and seventeen health departments, only two of these affording a full-time health official, and only eleven employing full-time nurses. Only the city of Milwaukee is large enough to afford a completely organized Public Works Department.

The Joint Committee's recommendations include: the authorization of the Legislature of a new form of local government for Milwaukee County, subject to the approval of local referendum; the formulation of zones in the county with differential tax rates; the abolition by amendment of constitutional offices unsuited to the new consolidated form; the provision by constitutional amendment for gradual consolidation of individual services; and an amendment to provide that debts contracted prior to consolidation should remain burdens of the original area alone.

LEE S. GREENE,
University of Wisconsin.

Truck Highway and "Trailways" Planned for Connecticut

NORWALK, CONN.—Two studies recently submitted to the Norwalk City Planning Commission for approval may interest many readers of THE AMERICAN CITY.

One of the functions of the City Plan of Norwalk, Conn., is to replan its present circulation system to better serve its residential, industrial and business requirements. By the Plan, interstate busses and heavy-duty vehicles are segregated from passenger cars and pedestrian traffic, just as freight trains are now separated from the passenger trains of a well-planned railway system.

As one part of this program, a truck highway is being planned through Norwalk parallel to the New York, New Haven, and Hartford Railroad right-of-way connecting with the Pelham-Portchester truck highway planned by Westchester County, New York. The need of this project became obvious when the 1933 accident statistics revealed that 64 per cent of the accidents for this city occurred on the Boston Post Road and 8 per cent involved busses and heavy-duty vehicles.

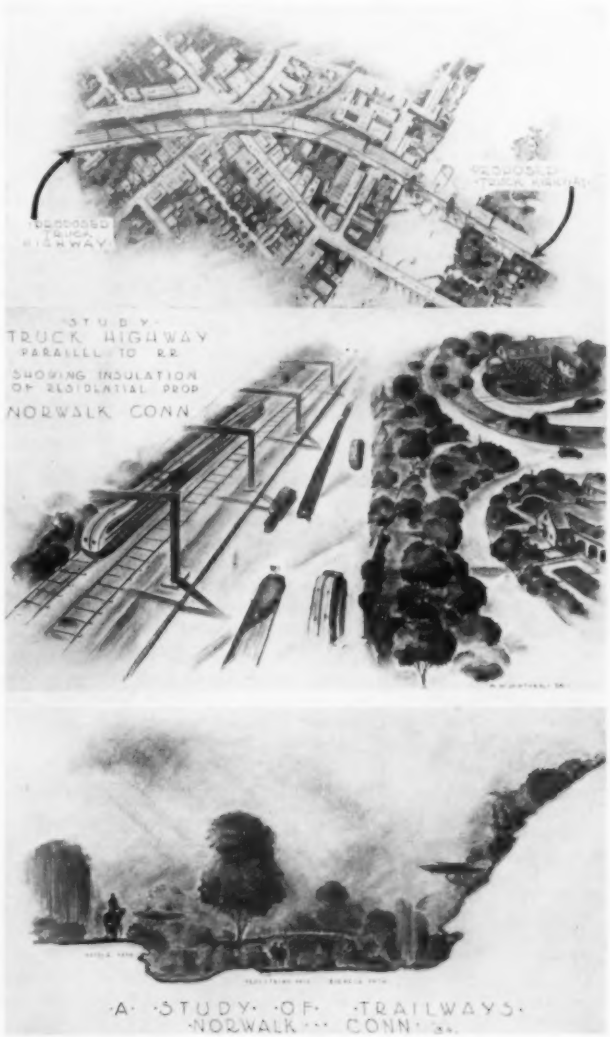
Adjacent to this highway it is proposed to plant a buffer strip varying from 50 to 100 feet wide. This strip would serve as a barrier between residential development and the combined railroad and truck highway, and would tend to increase rather than decrease property values along the railroad right-of-way.

This project is of course a major undertaking and not one to be easily carried out, since the truck highway would at times be necessarily diverted from the railroad, but always in close proximity to it; and again, in all probability the bridging and tunneling under rivers are problems to conjure with. Other features would have to include grade separations in each city or town, for delivery purposes.

Like numerous other municipalities throughout the country, Norwalk has inherited a wealth of charming brooks and streams winding their way through beautiful woodland areas. The banks of these streams may easily be cleared of brush and small foliage, and a series of winding trailways constructed along the banks for pedestrian and equestrian use only. These trailways would be improved from time to time, and bicycle and bridle paths added. Many of our citizens would enjoy hikes with their families, without the thought of encountering a barrage of "No Trespassing" signs. Rest benches along the trailways would serve the traveler at various scenic points, a fireplace here and there could be constructed where small groups could enjoy the natural loveliness of their city. A path for the equestrian would lend color to the scene and would undoubtedly have a host of users.

In planning such a trailway it is well to follow the stream a number of times before attempting a final plan, for beautiful shade trees or a wonderful vista may be overlooked and sacrificed on the first inspection. In most instances a natural path will be found along a gulley or stream, necessitating only the removal of brush and the construction of a few rustic bridges to create a most picturesque trailway.

The trailway in the Norwalk Plan is a continuation of the same feature of the Darien Plan and captures, for the suburban location, a rural atmosphere far superior to the usual block development found in city outskirts.



The City Planning Commission of Norwalk comprises: Mayor Charles E. Swartz, Hon. Member; James L. Burley, Chairman; C. Edward Scofield, Secretary; David Robinson, Albert Pohlman, Dr. F. J. Goldman, Frederick P. Stabell, Edward J. Kelly, John Cavanaugh, Richardson Wright, William Rusch, Paul J. James, and Judge Edward J. Quinlan.

The Commission was selected by Mayor Swartz to create a Norwalk City Plan and to study the city's future requirements. Joseph T. Woodruff, Fairfield County Planning Engineer, was selected as consultant, and the writer as assistant consultant; the assistance of Miss Eleanor Little, FERA Administrator for the state of Connecticut, was obtained. A staff of expert technicians was secured to draft a comprehensive plan of Norwalk, which includes 46 study maps, a 400 feet to 1 inch scaled land-use data map, a preliminary plan, population studies, charts and graphs, and 12 individual studies rendered in perspective depicting the future Norwalk.

GEORGE J. COMSTOCK,
Assistant Consultant, Norwalk City Planning Commission.

Oakland's Regional Park

OAKLAND, CALIF. — This city gave thought to the happiness of present and future generations in its overwhelming vote at the November election in favor of the creation of a Regional Park district. Sixteen square miles of natural park land are included, rivaling in beauty and size the playground of any other city in the world.

The area to be taken lies just back of the cities of the East Bay, in the picturesque Berkeley hills, and includes four mountain peaks — Grizzly, Bald Peak, Redwood Peak, and Round Top. The park lands are part of 44,000 acres originally purchased by the East Bay Municipal Utility District for watershed properties. Development of the Mokelumne water project removed their need for water purposes, leaving them available for public use as a recreational area.

Thousands of Federal workers under the direction of CCC and SERA, at no cost to the taxpayers of Oakland and adjacent cities, will be engaged in clearing trails, building roads, swimming pools, golf links, fashioning out-of-door fireplaces, preparing camp sites, etc., to the end that, at an early date, Mr. and Mrs. Eastbay, with their family, may enjoy to the full this beautiful wildwood area.

The campaign committee which made the successful fight for this undertaking was headed by Fred E. Reed, former Chairman of the City Plan Committee of the National Real Estate Association, and at present head of the East Bay Regional Plan Association. Mr. Reed would not accept the conservative counsel of many civil leaders, who, though interested in the park idea, felt that it should not be voted upon during a period of economic stress. The fact that the issue, in this California city, was successful by a 3 to 1 vote gives proof that courage, timely analysis, and determination to progress are still present in American cities and need only to be organized.

J. K. PETERSON,
Secretary, East Bay Regional Plan Association.

Tupelo's Mayor Explains Book-Keeping for TVA Power

TUPELO, MISS.—Our method of keeping accounts is as outlined in *Section 10, "Schedule of Rules and Regulations"* of our contract with the Tennessee Valley Authority. That section is as follows:

"Disposition of Contractor's Revenue: Contractor agrees to dispose of revenues from the operation of its municipal electric system in the following manner:

(a) Revenues will first be used for operating expenses, after which, in the order named, revenues shall be made applicable to interest on electric system bonds and/or other indebtedness applicable to said electric system, amortization of such bonds, or other indebtedness, reasonable reserves for new construction and other contingencies, payment to the general fund of contractor for taxes at rates equivalent to the taxes assessed against other property of similar nature, and a return on contractor's equity of not more than 6 per cent per annum.

(b) After the appropriation of the above amounts the contractor agrees that all remaining revenue shall be applied to reduction in the rates to consumer."

At the present time we are permitted to make a surcharge of 10 per cent on commercial and industrial accounts.

We keep all transactions in the department of electrical distribution separate from all other municipal accounts. Our gross income for the month of October, 1934, was.....$8,900.68
The cost of power for that month was 3,656.08

The income for month of October, 1933, was..... ....$6,810.27
The cost of power for that month was 2,869.60

One year ago we were buying power from the Mississippi Power Co. at 17 mills per kwh. It is now costing us about 5½ mills per kwh.

We own our distribution system and re-sell it under TVA rates. Before we contracted with the Tennessee Valley Authority for electricity our rates were lower than the average in Mississippi, and lower than the Mississippi Power Co. retail rates.

Our residential consumption has more than doubled since we contracted with the TVA. The commercial consumption has almost doubled, and we have had a large increase in industrial consumption due, however, to some extent, to our taking over some industrial customers who were formerly served by the Mississippi Power Co.

We are delighted with our TVA contract.

J. P. NANNEY,
Mayor.

Window Shopping Night in Allentown

ALLENTOWN, PA.—Local merchants feel confident they have solved the problem of making Window Shopping Nights successful promotional affairs. By employing novel themes for these events, at the opening of the spring and fall seasons, sales have been stimulated to such an extent that the stores have been well repaid for the expense and work connected with the displays.

Through the usual publicity channels, newspaper and radio, the merchants give the public information concerning the displays. For three weeks this publicity work is continued daily, with the result that on the night of the displays crowds estimated from 40,000 to 60,000 enter the city's central business district curious about the special displays. For three hours, from 7 to 10 o'clock, the window shoppers have the privilege of walking through a business district without regard for auto traffic, since the police shunt this traffic into other sections of the city. Only trolley cars carrying persons into and out of the shopping district handicap the free and easy movement of the crowds and these are operated so carefully that the risk to pedestrians is at absolute minimum.

Two taps of the fire alarm of the city at 7 o'clock announce the opening of the events. Then all window lights are turned on, curtains are raised and the show starts. Sometimes there are parked models of new autos in the business district, sometimes there are pageants, sometimes there are other displays placed on the streets or at Center Square.

Historical displays, antique displays, industrial displays, educational exhibits and other ideas have proved highly successful. In connection with the antique displays the committee in charge was able to exhibit America's oldest fire apparatus, wooden water mains, a covered wagon, a horse car and other objects on the street, while the stores brought forth items dating back to the revolutionary and pre-revolutionary days. Local industries sent machinery and operators into the store windows to show methods of manufacture of various products for the industrial program.

When these events are planned, something of interest to residents of towns and cities within a radius of 35 miles is usually voted upon. The entire trading area must have a part in the event. It is their show. Only one window or a portion of it is devoted to the special displays except in the larger stores where they have an abundance of window space.

Merchants are given plenty of information concerning the event, window decorators are consulted and participate in the planning, and animated displays are recommended wherever possible. One merchant's experience in connection with the industrial display shows the value of the animated windows. For six months after he had shown the method of manufacturing a nationally known underwear in his store window, customers kept walking into the store asking for garments such as they had seen manufactured in the window. Other stores reported telephone sales and store sales of regular merchandise immediately after the stores opened the day following the displays.

Allentown has been fortunate in procuring the hearty cooperation of all persons who have ever been asked to assist in making the event a success, but Window Shopping Nights are nights of major importance to persons living within a radius of 35 miles of the city, and with that interest aroused, it is only natural that even minor participation in the event becomes a topic for conversation.

WINFIELD CLEARWATER,
Manager, Chamber of Commerce.

Recent City Manager Appointments

WALTER J. BRAUN has been appointed City Manager of Middletown, Ohio, to fill the vacancy created by the resignation of H. O. Miller.

A. B. Gidley, former Manager of Burbank and Compton, Calif., has been reappointed Manager of Compton to replace Major Jules E. Hanique, who has served as Manager for the past two months. Mr. Gidley's appointment was effective December 6.

Walter Gray, a local man, has been appointed to fill the unexpired term of Guy P. Parker, City Manager of Eastland, Texas.

Boyne H. Platt, City Engineer, was appointed City Manager of Wilmette, Ill., on November 21. He fills the post made vacant by the resignation of C. M. Osborn last May.

Donald C. McMillan, City Engineer, who has been Acting Manager since the resignation of A. E. Stockburger, was appointed City Manager of Ventura, Calif., on November 19.

Col. William C. Torrence replaces Nathan O. Hultgren, as City Manager of Waco, Texas.

CLARENCE E. RIDLEY,
Executive Director, International City Managers' Association.

Two Other P. R. Cities

To the Editor of THE AMERICAN CITY:

The first story on page 70 of the December magazine is in error in excluding Hamilton, Ohio, and Boulder, Colo., from the list of cities using proportional representation.

EMMETT L. BENNETT,
Director, Municipal Reference Bureau, Cincinnati, Ohio.

December 10, 1934.

TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Maxwell Halsey, Chairman, Harry Hemmings, Reyburn Hoffman, Benoit Laberge, Theodore T. McCroskey, Donald M. McNeil, A. J. Naquin, Hawley S. Simpson, Arthur G. Straetz, Peter J. Stupka, Lawrence S. Tuttle, John C. Wrighton

Making Standard Traffic Regulations in Smaller Cities

AN outline of standard municipal traffic practice of special interest in cities of 100,000 population or less, forms the report rendered by the Highway Research Board's Sub-Committee on Traffic Relations in Municipalities in Washington December 6. The information can be used by the official in charge of traffic, be he Chief of Police, Traffic Engineer, Director of Public Safety, or Chairman of the Street Committee. The report is signed as Chairman by William S. Canning, Engineer Director, Keystone Automobile Club, Philadelphia, Pa., and by T. M. Matson, Traffic Engineer, Philadelphia, Arnold H. Vey, State Traffic Engineer, New Jersey, Edwin F. Koester, Traffic Engineer, Wilmington, Del., and Elmer S. Maxwell, City Engineer, Frederick, Maryland.

Signs and Signals

The uninformed motorist may suggest the need for a national system of signs, signals or traffic regulations, not knowing of the work done by the four National Conferences on Street and Highway Safety.

The National Conferences brought forth a series of model laws, both state and municipal, and recommended certain standards for highway and municipal traffic signs, signals and markings. These several codes and recommendations have been modified and brought up to date in later Conferences, and are now in the last stages of publication in their final form. Unfortunately, there is no way of requiring all the states to adopt the national regulations. More and more widely the standard signs are becoming understood and recognized by the motoring public, and, even more important, standard signal installations are being adopted largely through the cooperation of the manufacturers, who have participated most heartily and extensively in the development of the several codes.

There still exist, however many old-time signals manufactured and sold long before the inception of the national codes or any of the subsequent manuals of operation of traffic signals.

a. *Signs.*—Traffic signs must be understandable, the notice positive, and be quickly read. The standards adopted by the U. S. Government and the National Conference on Street and Highway Safety fix definite shapes and colors for each type of sign.

Shapes.—Square signs have been adopted for caution; diamond shape for warning of a more serious hazard; octagonal for "Stop" signs; round for railroad crossings.

Color Combinations.—The U. S. Bureau of Public Roads and the U. S. Bureau of Standards have proved black letters or symbols on yellow background are superior to all other color combinations for visibility. For direction signs and route markers, the combination of black letters on white background is used.

Symbols.—Symbols are more readily understood at a single glance by all drivers; words should be short and few.

Lettering.—Advertising companies have learned that signs to be most readable should have not more than 70 per cent of the vertical background occupied by the text. The following letter sizes can be read at the distances stated:

1".....20 feet	3"..... 70 feet
2".....45 feet	4".....150 feet
5".....200 feet	

Route Markings and Detour Signs.—Route markings and detour signs present the most difficult problem for officials of a municipality. Departure from a straight road or the usual route of travel should be so well marked that even the most unobserving driver cannot fail to see one or more signs giving notice of the turn. Even after the turn is made, "assurance" signs should be erected to satisfy the driver that he is on the right road and has made the proper turn. Numerous signs at every turn may be necessary to carry out this plan.

Mounting.—Signs should be visible over the tops of parked cars. If parking is not likely, then the signs may be mounted at a height of about 3 feet above the crown of the road, always on the right and facing in the direction from which they are to be read.

Lighting.—Night driving requires that some form of lighting be provided. If the sign is not in a position to be lighted by street lights or in direct line of the headlights of the vehicle, by all means it should be provided with reflector devices, preferably buttons.

Material.—The best of material and workmanship is the greatest economy. Signs are forced to withstand the most severe weather conditions and are subject to accidental damage or deliberate abuse; yet they must always tell their story. If a sign is considered necessary at all, it must convey its message at all times. The use of rust-resisting steel and the best grade of paint will cost but a few cents more per sign than cheaper material. The cost of erection of the sign is the largest single item. Therefore, it would seem that it is much cheaper to spend a few cents more for high-class material and workmanship in the first place than to have to replace the sign at frequent intervals. A rusty, discolored sign is no good to the driver and a definite discredit to the municipality.

b. *Signals.*—A traffic signal is expensive to install and is a continued expense for its operation. Unless properly installed, operated and continuously maintained, traffic signals may become a nuisance or even a definite hazard to vehicles and pedestrians alike. No signal should be installed unless it can be justified by traffic volume, pedestrian movement or accident rate, or some combination of these factors.

Traffic Volume.—The minimum volume of traffic which warrants a signal is 1,000 vehicles per hour for at least 8 hours of the day. Of this 1,000 vehicles, at least 250 vehicles should enter the intersection from the cross street. When the volume of traffic entering the intersection from all directions falls below one-half of this minimum, the signal should be changed to operate as a flashing amber light on the "through" street and a flashing red light on the side street.

Pedestrian Movement.—When pedestrians numbering about 300 per hour must cross the main street in the face of vehicles numbering 750 or more per hour and traveling at speeds in excess of 15 miles per hour, traffic signals may be warranted.

Accidents.—When accidents number 5 or more per year, a traffic signal may be warranted. The use of the lesser remedies should be tried first: the "Stop" sign or the flashing light.

Physical Conditions.—Other things to be considered in the installation of a traffic signal are heavy left-turning movement, grades, lack of sight distance, the necessity for controlling speed.

Effect of Signals.—Traffic signals cannot be expected to prevent accidents. Three separate studies in different parts of the country covering 599 intersections,

before and after signals were installed, showed that 36 per cent had an increase, 59 per cent a decrease and 5 per cent showed no change. The same study showed that the installation of signals had no effect on the accident rate if fewer than 5 accidents per year were recorded. The effect of signals on the type of accidents showed that while right-angle crashes were reduced about 56 per cent, rear-end and side-swipe collisions increased about 37 per cent and pedestrian accidents showed little change.

Conclusions.—That unless the accident rate is high, traffic signals are no help; that the more serious collisions, right-angle crashes, may be reduced, but that rear-end collisions may increase and that pedestrian accidents have not been reduced by the installation of signals.

Simplicity.—The best signal system is that which does its work in the simplest manner. If signals are decided on, the simplest form of signal operation is that which will stop the traffic on one street and allow it to go on the other for a time, and then reverse the movement. A third period for any purpose, turning movement, pedestrians or other reason, is seldom needed.

Cycle Length.—The cycle length should be kept as short as possible. Studies by the U. S. Bureau of Public Roads at a heavily traveled intersection in Washington showed that short periods were the best, and that there is no advantage in favoring heavily traveled streets with extremely long periods. It was found that with periods of about 15 seconds on each street, approximately 1,000 vehicles per hour could pass through the intersection of two simple two-lane streets. Since intersections carrying greater volumes of traffic than this are seldom found in the small community, the short cycle of 15 to 20 seconds on each street will provide ample time to pass all the vehicles approaching most intersections.

Objections to Long Cycle.—The long cycle has many objections. Probably the most serious is that it creates the desire on the part of drivers who are familiar with the signal to "beat the light." The long cycle creates a feeling of impatience and disgust in the minds of the operators who are forced to wait on the cross street for the light to change, perhaps while few vehicles are using the main street. Pedestrians are more likely to disregard the light entirely and cross whenever they get a chance.

The Amber Light.—The amber light is used following the green and before the red, to give warning of the change of signal. An amber light of from 3 to 4 seconds in length is sufficient in nearly all cases.

No Amber after Red.—There is no place for an amber light following the red. Drivers approaching a signal which shows a red light should know that they must wait until the green light appears.

Unusual Signals.—Long amber lights for turning or for pedestrian movement, or perhaps the red light shown all around, or the flashing red or amber light for movement of fire apparatus, are unusual, are not generally accepted as standard throughout the country, and are objectionable, again giving rise to the complaint of lack of standardization of traffic signals throughout the country. There is seldom any real need for such unusual signal indications, and they should be avoided wherever possible. Standard showings of signal lights, fully understood by every driver, will go further toward reducing the accident toll than will signal lights the meanings of which may be unknown to any but local people.

Conditioning $5 Autos

JUNK cars selling for $5 to $50 have been singled out as one more menace of the road by Thomas P. Henry, President of the American Automobile Association. As the tabloid newspapers attracted people who had never read newspapers before, so these junk cars are probably getting people used to having a car who had never expected to own one. It is important, of course, that these cars be safe and, as Mr. Henry questions, how can they be at the price? As accidents are usually caused by people and not by mechanisms, the ownership and passenger list are certainly as important as the condition of these rattletraps. Nevertheless, compulsory inspection of motor vehicles by the municipalities in which the owners reside is the closest approach to control yet suggested.

Platoons and Motorcycles for Santa Barbara

IN a reorganization of the Police Department of Santa Barbara, Calif., last July, writes Chief Jess A. Butts, shifts which had been 8 P.M. to 4 A.M. to noon, to 8 P.M., were changed to the platoon system, the first platoon on duty 8 A.M. to 4 P.M.; the second, 4 P.M. to midnight; the third, midnight to 8 P.M. This action was taken following a crime survey which showed that more crimes were committed between 8 P.M. and 4 A.M. than at any other period of day or night. "Consequently," says Chief Butts, "the weight of the personnel of the Department was placed on the second shift. Officers that held the rank of lieutenant were put in charge of the platoons, and the desk sergeants were placed at the head of each platoon, all the members of which were responsible to the desk sergeant."

"Also at this time," he continues, "the motorcycle department was disbanded and these motor officers were placed in cars, and this practice continued for approximately six weeks. Due to the increased traffic conditions, and particularly to drunken driving and reckless driving, it was found necessary to put back the motorcycles, as they are more effective than cars.

"We have found the present line-up works to great advantage to the department."

Faulty Vehicles Increase 111 Per Cent in Detroit

OF the 22,293 traffic accidents in Detroit in the first nine months of 1934, there were 661, or 3 per cent, caused by defective vehicles. This compares with 314, or 1.2 per cent, in 1933. The causes and the increases are as follows:

Defective	Number 1934	Number 1933	Per Cent Increase
Brakes	459	212	116
Lights	120	55	118
Steering	82	47	75

Voices of Caution

TWO police departments as far distant from each other as Detroit and Birmingham are using loud-speaking automobiles to make people aware of the eternal need for caution in using the streets. At Detroit it is the little people who are summoned by music and then told by the stalwart kindly policeman to watch their step. Accidents to children increased 13 per cent here in the first three-quarters of 1934. The view below shows the lively-colored Ford used in an effort to correct this condition.

At Birmingham, a regular patrol car makes the rounds of the street intersections and reminds both pedestrians and motorists of the traffic rules. It is dark-colored, named the Voice of Caution, and it addresses any one within half a mile.

DETROIT POLICE TRAIN CHILDREN TO AVOID TRAFFIC ACCIDENTS

IMPROVING MUNICIPAL ADMINISTRATION

Current Items from the Public Administration Clearing House

Non-Interest-Bearing Bonds for Cities?

CITIES should be allowed to issue non-interest-bearing bonds to pay for public works that are not intended to be self-sustaining. They should be given the same rights as national banks—to create credit for themselves without paying interest. This proposal was made by A. A. Berle, Jr., City Chamberlain of New York, at the recent meeting of the U. S. Conference of Mayors in Chicago as an aid to cities now unable to undertake public works because of huge accumulated debts. The plan was incorporated in principle into a resolution adopted by the Mayors and supported also by the American Municipal Association.

Mr. Berle distinguishes between the kinds of public works projects for which cities lay out money: those like water systems, transportation systems and sewage systems, which generate profit and pay their own way; and those like municipal hospitals, playgrounds, and schools, which are not intended to be self-sustaining. He limits the proposal for credit-without-interest to the second kind of project. The resolution passed by the Mayors asked the Federal Government to lend the cities money at a rate of interest not exceeding one-eighth of one per cent.

"The proposal for non-interest-bearing municipal bonds for public works projects represents a change in our conception of credit," says Paul V. Betters, Executive Director of the U. S. Conference of Mayors and the American Municipal Association, "but it is not new." The Wisconsin League of Municipalities, he points out, has officially passed resolutions asking for issuance of currency by the Federal Government on the collateral of municipal bonds, and the New York Conference of Mayors has likewise sponsored proposals making local securities eligible for discount at the Federal Reserve Banks. Over a hundred cities, including Portland, Salt Lake City, and Milwaukee, have asked by official resolution that municipal governments be given the same privilege as national banks—to take their securities to the proper fiscal agencies and have the right to issue currency against them.

To Investigate Fire Insurance Ratings

AN investigation of the system of grading cities used by the National Board of Fire Underwriters in fixing basic fire insurance rates is being undertaken by the Governmental Research Association, according to an announcement by its President, Carter Atkins, Director of the St. Louis Bureau of Municipal Research.

A special committee has been appointed to determine whether the underwriters' grading system forces cities to maintain unnecessarily elaborate and extensive fire-fighting equipment. Despite their desire to meet taxpayers' demands for economy, city officials have found themselves under pressure to maintain or extend expensive physical equipment—mains, hydrants and apparatus—under threat of higher insurance rates if the city's classification were changed by the Board of Underwriters. If the investigation reveals that heavy expenditures for physical equipment are not always necessary for adequate protection and that a city's fire prevention activity or fireman efficiency is an equally important protective factor, the committee will recommend definite steps to correct the situation from the standpoint of the taxpayer without jeopardizing the interests of property owners.

According to Harold A. Stone, a member of the investigating committee who is the author of the recently issued "Fire Insurance Classification of Cities and Fire Losses," in many instances actual fire losses have little or no relation to the underwriters' classification of the cities, the important factor in setting fire insurance premiums.

The fire underwriters rate cities for water supply, fire-fighting apparatus, the alarm system, building laws, unusual fire hazards, structural conditions and climate. Mr. Stone suggests as additional factors for consideration the ability of the firemen to use fire defenses; fire prevention work; the amount of indifference and carelessness of citizens; and the actual fire losses over a period of years.

Members of the Governmental Research Association committee, in addition to Mr. Stone, are: Robert Goodrich, Director of the Providence Governmental Research Bureau, Chairman; Clarence E. Ridley, Executive Director of the International City Managers' Association; Herman Loeffler, Secretary of the Boston Municipal Research Bureau.

The People Advance County Government Reorganization

"THE November elections have cleared the way for some promising experiments in county government reorganization," says Robert M. Paige, Secretary of the Governmental Research Association. "Important proposals for county reforms were put before voters in many states. In most cases sentiment proved to be in favor of the changes."

Florida voters approved a constitutional amendment which will permit consolidation of the city of Jacksonville and Duval County. Montana voters approved a constitutional amendment allowing the consolidation of county offices. Citizens of Milwaukee voted to have their aldermanic representatives also represent them on the county board, thus reducing the number of elected officers. Voters of Milwaukee County approved an amendment permitting consolidation of the duplicating service departments now maintained by the several governmental units within the metropolitan area.

Four Ohio counties—Hamilton, Mahoning, Cuyahoga and Stark, containing respectively the cities of Cincinnati, Youngstown, Cleveland and Canton—elected commissioners to draft charters providing new forms of county government, permitted by a county home rule amendment to the state constitution in 1933. Charters drafted by these commissioners will be submitted to voters in the counties concerned in 1935. Summit, Franklin and Montgomery Counties defeated proposals to elect charter commissions.

Los Angeles County approved a charter amendment which will permit the county to perform municipal services for any city desiring to contract for such an arrangement. Another charter amendment providing for consolidation of the offices of county tax collector and county treasurer was also approved.

Proponents of county government reorganization suffered defeat in two states—Michigan and Texas. Michigan voters vetoed a proposed county home rule amendment to the constitution. Texas voted down eight proposed amendments relating to county reorganization, consolidation of certain county offices and abolition of the fee system of paying public officials.

Cutting Election Costs

COUNTIES looking for an opportunity to effect painless economies might well re-examine their election costs. The New Jersey Taxpayers' Association has just completed a study of one of the cost elements — ballot-printing — in ten New Jersey counties. These counties spent $71,850.40 for printing the ballots used in the 1933 elections.

Analysis shows that one county spent only $7.20 per thousand square feet of ballot, while another county had to spend $13.44. The cost of ballots per election district within the counties ranged from $24.59 to $61.30. The cost per thousand ballots varied from $16.50 to $39.40. Part of these variations is due to the fact that some ballots have more printing on them than others. The Association believes, however, that by employing centralized printing of ballots, a saving of 25 per cent could be made.

At present, county clerks in New Jersey, who provide the ballots for elections, are not compelled to advertise for competitive bids for printing. In four counties where the ballot-printing contracts were awarded on sealed bids, the cost

was from $7.20 to $12.96 per thousand square feet. One county awarding a contract on open bidding paid $10.40. Five counties awarding contracts without bids paid from $8.13 to $13.44 per thousand square feet for their ballots.

"Reduction in the cost of printing ballots is only one avenue to more economical elections," comments Clarence E. Ridley, author of "How Cities Can Cut Costs." "Permanent central registration leads to large savings, as indicated by experience in Detroit, where it is estimated that $70,000 has been saved in four years." Among other possible economies are: greater centralization of responsibility for administering elections; reduction of the number of election precincts; and the purchase of all election equipment and supplies under approved centralized purchasing procedures. Reduced election costs would also result from drastic reduction in the number of officials to be elected through the adoption of the short ballot principle.

Cities Urged to Enter Milk Business

MILK control and distribution may soon become a necessary duty of cities, Frederic C. Howe, Consumers' Counsel of the U. S. Department of Agriculture, told representatives of 31 state leagues of municipalities at the meeting of the American Municipal Association held in Chicago recently. Getting more milk to more people at prices they can pay has become a problem of national importance. Milk control boards in many states and the AAA set the prices the distributor pays the farmer at a comparatively low level—an average of 4 cents a quart. The housewife pays all the way from 11.4 cents to 16 cents a quart. To solve the problem of supplying milk at reasonable prices to 60 million consumers of the nation, Mr. Howe outlined three possible methods:

1. Make milk a municipal utility. Sell milk to customers at a municipal pasteurization plant for the price paid the farmer, plus the cost of pasteurization, which is from ½ to 1 cent a quart. In this way milk could be sold for as low as 5 cents a quart in some cities and from 6 to 8 cents in others.

2. License milk agencies, compelling them to operate as other health agencies do—at cost plus reasonable return.

3. Put milk distribution on a franchise basis. With this plan established by city ordinance, one company might be allowed to distribute in one section of the city and another company in another, thus avoiding both cut-throat competition and price fixing by half a dozen or more dealers distributing in the same block.

"Municipal milk control and distribution is new," Mr. Howe said. "But it is definitely the problem of cities and towns, and involves the health of seven million undernourished children with weak bones and bad teeth, possibly rickets, who will be a burden twenty years hence if they are not given enough milk."

City Attorneys Organize; Will Develop Library of Ordinances

MUNICIPAL attorneys who advise and counsel cities of 50,000 or more now have a central clearing house for mutual aid on their problems, in the newly organized Institute of Municipal Law Officers. The Institute, formed by city attorneys meeting in Chicago recently, elected Henry E. Foley, Corporation Counsel of Boston, President. Raymond J. Kelly, Corporation Counsel of Detroit, is Vice-President. Paul V. Betters, Executive Director of the American Municipal Association and the United States Conference of Mayors, will act in the same capacity for the attorneys. Headquarters will be at the Public Administration Clearing House in Chicago.

City legal problems and legislation beneficial to municipal corporations will have the special attention of the Institute. One of its first undertakings will be development of a complete library of ordinances in effect in American cities. This will make it possible for a city needing assistance on any particular legal problem to gain information on ordinances on the same subject elsewhere, thus avoiding the mistakes and profiting from the successes of their sister cities.

340 Agencies to Improve Government

THREE hundred and forty agencies established for the purpose of bettering the administration of local, state and national governments exist in the United States at the present time, according to the Directory of Governmental Research Agencies in the United States issued recently by the Governmental Research Association, Chicago. "During the past year there has been more activity in the field of governmental research than during any similar period in the country's history," comments Robert M. Paige, Secretary of the Governmental Research Association, in announcing the roster.

The 340 agencies are of several different types. Their common aim, however, is to improve public administration in the states, cities and counties by reaching out the facts about governmental problems in particular situations and showing public officials how to put into practice the accepted principles of business management and political science. Municipal research bureaus, directors and staff members of which form the nucleus of the Government Research Association, number 48. Most of these are supported by voluntary contributions from citizens. Three of these organizations—the Fort Wayne Taxpayers Research Association, the Taxpayers Research Bureau of Utica, and the Tulsa Bureau of Municipal Research—were established within the past year. The Municipal Research Department financed by the city of Hartford, Conn., and the Bureau of Governmental Research of the Indianapolis Chamber of Commerce were also set up in 1934.

In addition to agencies confining their attention to the government of a particular city, nearly 150 state organizations are included in the directory. State-wide citizen organizations number 43; state leagues of municipalities, 33; and universities carrying on practical research in current governmental problems, 72. The Minnesota Institute of Governmental Research and the New Hampshire Foundation are two significant state bureaus formed during the year. National organizations of public officials, national citizen organizations, professional consultants in municipal management and private firms carrying on research in the fields of public finance and municipal credit are among other types of organizations listed in the directory.

"This is the most comprehensive directory ever published by the Governmental Research Association," says Mr. Paige. "It is hoped that its distribution will help the rapidly growing governmental research profession achieve a sense of solidarity and aid in the interchange of information and experience."

Police Radio Meets "Interference"

POLICE radio in several cities of the country, according to report, is confronting three kinds of "interference" that hinder efficient performance in the line of duty. Curious citizens who crave excitement, criminals who like to be warned of their ditscovery at work, and a new species of "ambulance chaser" are taking advantage of short-wave radio sets to the disadvantage of public protection. The new "ambulance chasers" are the commercial auto-wrecking companies which tune in on accident calls so as to get to the scene post-haste and ply their trade. Sometimes so many of these auto-wreckers are on hand that the police ambulance has difficulty in reaching the injured.

In Toledo, Ohio, one of the cities reporting this kind of trouble, the Commission of Publicity and Efficiency has recommended that police be given the authority to handle the disposition of wrecked cars. The towing service might be let out to wrecking companies by contract, it is suggested, or the city might establish its own. San Antonio, Texas, police, who have also been hampered by auto-wreckers at accidents, are trying to work out a code for their broadcasts that will eliminate these chasers as well as the crowds of curious citizens that collect at accident, fire or trouble calls.

Police of Tampa, Fla., discovering that thieves and other criminals find police radio broadcasts an asset in their business, are broadcasting commands to cruising cars in code. Cincinnati encourages its citizens to listen to police radio calls, but attempts to avoid aiding criminals on the run by a general ordinance forbidding short-wave radios in automobiles. Albany, N. Y., also has such an ordinance. Atlantic City claims that its new radio cars are operated on a wave-length system so exclusive that no device yet marketed will pick-up the police calls.

Prepared by
FRANK B. WILLIAMS
Author of "The Law of
City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected
by the Zoning Committee
of New York
(233 Broadway)

Boards of Appeals

CALIFORNIA.—*Rehfield v. City and County of San Francisco*, 21 P. 2d, 419 (Supreme Court, April 27, 1933).—The plaintiffs are owners of a piece of land used as the site of a grocery store. The district in which the land is situated is zoned for residences. The store was erected many years before this zoning ordinance was passed, and is permitted to remain, under the terms of the ordinance, as a non-conforming use.

The plaintiffs are seeking to enlarge their store by extending it 22 feet back into a vacant lot, and were refused permission because this would be contrary to the terms of the zoning ordinance. Plaintiffs applied to the City Planning Commission to rezone this 22 feet so as to permit this enlargement, and the application was refused. The plaintiffs then began this action. The lower Court found that the deepening of the store would not adversely affect the public health, safety, comfort, morals, convenience or welfare, declared the right of plaintiffs to carry out their plans, and enjoined the city from interfering.

This Court holds that the Courts have no right to change an admittedly valid zoning ordinance, and dissolves the injunction, leaving the city free to prevent the plaintiffs from carrying out their plans to enlarge their store.

EDITOR'S NOTE.—If the lower court was correct in its findings, it may be an unnecessary hardship to prevent the plaintiffs from enlarging their store, or, in other words, it may be a hardship which, in the special circumstances of this case can be remedied without inflicting serious injury upon the community; especially if proper conditions are imposed in the public interest. In such a decision the use of discretion is necessary, and there is no agency in California to whom such power is given. In most of our states this power is granted to boards of appeals, created for the purpose, with appeals to the courts from their findings. There seems to be a growing feeling in California that the law of that state should be amended to allow the creation of such boards. See on this subject these Notes for October, 1934.

COLORADO.—*City of Colorado Springs v. Miller*, 36 Pac. 2d, 161 (Supreme Court, September 10, 1934).—Miller is the owner of a lot with a small dwelling house on it, in a district zoned for residence. The district is in one of the best residential districts of the city. Miller's house is between a drug store and a building occupied by a grocery store and a baker shop. Miller, refused a permit for the erection of a store building by the Building Inspector, applied to the Board of Adjustment for a variance of the strict letter of the ordinance in harmony with its general purpose and intent, claiming that otherwise he would be subjected to unnecessary hardship. This relief was denied first by the Board, and then, on appeal, by the lower Court; whereupon Miller appealed to this Court.

The Court upheld the Board and the decision of the lower Court, finding that Miller was subjected to no exceptional or unnecessary hardship.

EDITOR'S NOTE.—It will be noticed that Miller's lot was situated between two business buildings. It is often a hardship to compel the owner of such a lot to use it for residence; but in the opinion of the Court, on all the facts, it was not so in this case.

Oil and Gas Wells

OKLAHOMA.—*Van Meter v. Westgate Oil Co.*, 32 Pac. 2d, 719 (Supreme Court, May 8, 1934).—The governing body of a city may regulate the oil industry and the drilling of wells within the corporate limits or prohibit wells from being drilled in certain territory.

To justify the Board of Adjustment or the District Court on appeal from the decision of the Board in granting a permit to drill an oil well contrary to the letter of the ordinance, it must be shown (1) that the granting of such a permit would not be contrary to public interest; (2) that this literal enforcement of the provisions of the ordinance will result in unnecessary hardship; (3) that by granting the permit contrary to the letter of the ordinance the spirit of the ordinance will be observed; (4) that by granting such a permit substantial justice will be done.

Even though the Board of Adjustment or the District Court may have permitted the drilling of other wells within the city in violation of the ordinance, this fact will not serve as a precedent or right for another party to insist that he is permitted to drill likewise. Each applicant for a permit must stand upon his own rights.

OKLAHOMA.—*Beveridge v. Harper and Turner Oil Trust*, 35 Pac. 2d, 435 (Supreme Court, September 11, 1934).—By the zoning ordinance of Oklahoma City the area within it was divided, with respect to its possible use for production of oil and gas, into two zones; in one of which exploration for and production of oil and gas is permitted under certain restrictions, and in the other prohibited. The defendants, Harper and Turner, own property in the district in which the production of gas and oil is prohibited, and attack the prohibitory regulation as unreasonable and therefore void. They assert that drilling operations and production can be accomplished at the proposed location with reasonable safety to the lives and property of others. The defendants further assert that drilling and production are permitted on other property similarly situated, and that therefore the zoning ordinance of the city is discriminatory and void.

Oklahoma City is a large and growing municipality. Experts assert that oil-producing sands underlie a large portion of the city, used for business and residence. Harper and Turner's proposed well lies within the potentially productive area. It is in a high-class, thickly settled residential area. Harper and Turner propose to locate the well in the court in the center of a block. The distinction between the area in which drilling is allowed and that in which it is prohibited is that in the drilling area the residences are of the cheaper class, while in the new drilling area they are of better construction, the best residential area in the city being within this district where drilling is forbidden.

Without doubt oil production is a potential danger to health and safety. The power to restrict the use of certain property in connection with the exploration for and the production of oil and gas is not limited to mere regulations prescribing the manner in which production may be accomplished. On the contrary, it includes the power to prohibit the use of private property for that purpose when such use is inconsistent with public health, safety, morals or general welfare.

In view of the density of population in the area involved, the character of the improvements on the property, its proximity to better improved property, the possible and probable effects of oil development on the area as it is now situated, and its probable effect on the future growth and development of the city, the Court decides that the City Council had the power to make the regulation in question.

And the Court believes and decides that there is no unlawful discrimination between the owners of property in the areas in which drilling is allowed and those in which it is forbidden. The distinction between these owners seems proper in that there is a gradual improvement in property as one passes away from the oil drilling area. Nor does the fact that property has been included in the drilling area which is in many respects similar to the property of Harper and Turner militate against the validity of the zoning ordinance. The municipal legislature may have committed the error of permitting drilling in areas where in the exercise of better judgment it should have been prohibited. It does not follow that having erred once it is charged with a legal duty to err again.

The Court therefore holds that the division line between the drilling and the non-drilling areas is not unreasonable or discriminating, but is a valid exercise of the police power.

EDITOR'S NOTE.—In general the law in this case is familiar to our readers, similar cases having appeared in our Notes for April, 1931, April, 1932, February and June, 1933, and August and October, 1934.

In one respect the legal conclusion of the Court seems open to criticism. The fact that a district is more expensively improved, and occupied by people of greater wealth, does not entitle it to greater protection of health and safety than a poorer district.

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Accidents

City held liable to pay patient for burns carelessly caused by municipal hospital nurse (Minnesota Supreme Court: *Borwege v. City of Owatonna*, 251 N. W. 915).

City held not liable for injury to pedestrian who slipped on manhole cover at alley crossing (Louisiana Court of Appeal: *Linxwiler v. City of Shreveport*, 151 So. 81).

City held liable for injury to pedestrian caused by displaced metal edging of curbing (Louisiana Court of Appeal: *Miller v. City of New Orleans*, 152 So. 141).

Failure to give statutory notice of injury within six months held to preclude suit for damage, in the absence of proof of mental or physical incapacity preventing giving of the notice (North Carolina Supreme Court: *Foster v. City of Charlotte*, 174 S. E. 412).

Condemnation Proceedings

Reassessment by special commissioners of benefits to land condemned for park purposes held not vitiated because identical as to figures with original assessment made by Board of Park Commissioners (Minnesota Supreme Court: *Board of Park Commissioners, Minneapolis, v. Bremner*, 252 N. W. 451).

Ordinance permitting buildings on condemned land to remain until public need required removal held not to repeal condemnation ordinance (Pennsylvania Superior Court: *Campbell v. City of Philadelphia*, 170 Atl. 467).

Contracts

Contract for materials for fire-alarm system held subject to statutory requirement advertisement for bids (Washington Supreme Court: *Reiter v. Chapman*, 31 Pac. 2d, 1005).

Contract for water and light plant machinery held to create debt within constitutional limitation (Colorado Supreme Court: *Reimer v. Town of Holyoke*, 27 Pac. 2d, 1032).

City held liable with contractor for injury to adjacent property through vibrations produced by iron ball dropped to break up pavement (Illinois Supreme Court: *Macer v. O'Brien*, 190 N. E. 904).

Garbage

City held not liable to assignee of contract for removal of ashes and refuse for extra compensation promised by city for removal of garbage (Massachusetts Supreme Judicial Court: *Dunn v. City of Boston*, 190 N. E. 594).

City held liable for depreciating value of nearby property through maintaining dump for garbage, etc. (Texas Court of Civil Appeals: *City of Longview v. Stewart*, 66 S. W. 2d, 450).

Mayor's Veto

Motion ratifying purchase held administrative, not legislative, action, and therefore not subject to veto (Tennessee Court of Appeals: *Boyer Fire Apparatus Co. v. Town of Bruceton*, 66 S. W. 2d, 210).

Ordinances

Ordinance increasing peddler's license tax from $2 to $4 per day held invalid as prohibitive and designed to protect local merchants (St. Louis Court of Appeals: *City of Washington v. Reed*, 70 S. W. 2d, 121).

Ordinance licensing plumbers upheld (North Dakota Supreme Court: *State ex rel. City of Bismarck v. District Court*, 253 N. W. 744).

Holder of restaurant and refreshment license held entitled to compel transfer to new location (West Virginia Supreme Court of Appeals: *Drew v. City of Mount Hope*, 171 S. E. 743).

Village ordinance imposing $50 yearly license fee against peddlers, etc., held not invalid as imposing exorbitant fee nor because exempting resident merchants (Niagara County Court, New York: *People v. Cowdrick*, 268 N. Y. *Supp.* 825).

Police Bands

Right to enjoin police band from competing with private musicians held not proved (New York Supreme Court, New York County: *Goebel v. Bolan*, 268 N. Y. Supp. 501).

Public Health

Board of education rule requiring vaccination as condition to school attendance upheld (Texas Court of Civil Appeals: *Booth v. Board of Education of Fort Worth*, 70 S. W. 2d, 350). Ordinance to same effect upheld (Mississippi Supreme Court: *Hartman v. May*, 151 So. 737).

Milk dealer applying for license held not entitled to require health authorities to inspect source of supply outside city limits as basis for license, even though he would pay expense (Ohio Court of Appeals, Hancock County: *State v. Spitler*, 190 N. E. 584).

Special Improvements

Failure to personally notify owner of lot of intent to pave sidewalk held not to vitiate assessment where lot remained in name of his predecessor on city assessment records (Maryland Court of Appeals: *Mylander v. Mayor and City Council of Baltimore*, 172 Atl. 234).

Railroad property enhanced in value for other use is assessable for local improvement although not thereby benefited for railway use (Minnesota Supreme Court: *Board of Park Commissioners of Minneapolis v. Bremner*, 253 N. W. 761).

Streets

City held to have abandoned street, preventing reopening without compensation to owner of adjacent land (United States Circuit Court of Appeals, Sixth Circuit: *City of Flint v. Grand Trunk Western R. Co.*, 69 Fed. 2d, 604).

Street Widening

Ordinance offering payment, etc., to owner of lot partly needed for street widening held to become contract without further formality on his signifying acceptance (Oregon Supreme Court: *Winklebleck v. City of Portland*, 31 Pac. 2d, 637).

Taxation

Uncompleted building held taxable as of certain date although not occupied until afterward (Illinois Supreme Court: *People v. Marshall Field & Co.*, 189 N. E. 885).

Statute reducing interest rate on taxes delinquent for previous years held valid (Florida Supreme Court: *City of Marianna v. Russ*, 154 So. 317).

City, City Attorney and Marshal held not liable for levying property tax execution on ground of trespass (Georgia Supreme Court: *Plunkett's School for Boys v. City of Thomasville*, 173 S. E. 656).

Tax Exemptions

Lot on which exempt building had not been completed until after beginning of tax year held not exempt from taxation for that year (Pennsylvania Superior Court: *Dougherty v. City of Philadelphia*, 172 Atl. 177).

Exemption of municipalities from taxation held not to extend to tax on gasoline used by municipal vehicles (Oklahoma Supreme Court: *City of Ardmore v. State*, 32 Pac. 2d, 728).

Traffic Regulations

Ordinance forbidding automobile driving by persons under sixteen years old upheld (Tennessee Supreme Court: *Phoenix Indemnity Co. v. Barrett*, 67 S. W. 2d, 135).

Ordinance requiring vehicles, excepting those of police and fire departments, to stop at "Stop" signs at street intersections held not to except ambulances on emergency call, although street was state highway (Tennessee Supreme Court: *Thompson v. City of Memphis*, 66 S W. 2d, 990).

Water Departments

Water revenue certificates held not "bonds" or "debts" within constitutional debt limit, etc. (Florida Supreme Court: *State v. City of Miami*, 152 So. 6).

Proper bases for determining reasonableness of rates for service by municipal plant stated (Pennsylvania Supreme Court: *Shirk v. City of Lancaster*, 169 Atl. 557).

President Roosevelt Urges Governors to Expedite PWA Helps for Cities

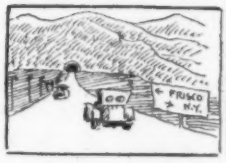
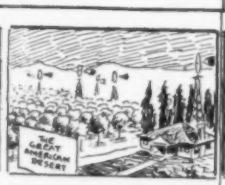
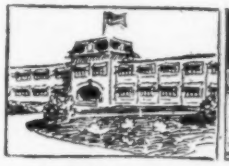
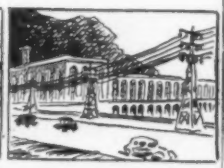
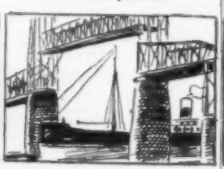
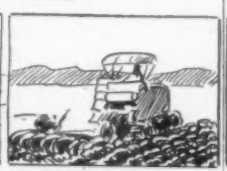
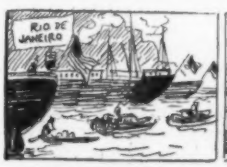
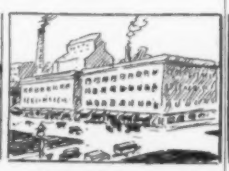
THE President has written letters to Governors or Governors-elect in the forty-eight states offering the assistance of the Public Works Administration in the preparation of legislation which would enable municipalities and other public bodies to obtain fuller benefits of whatever additional public works program is authorized at the coming session of Congress.

The President submitted to the states for their consideration general suggestions covering the simplification of procedure for bond issues, the delegation of greater powers to municipalities to issue bonds, slum clearance and low-cost housing, rural electrification, and creation of municipal improvement authorities.

The Legal Division of PWA, which already has assisted a number of states at their request in the preparation of legislation designed to facilitate and expedite the public works program, was designated by the President as the Federal agency which upon invitation will assist the states in the formulation of their legislative programs.

The graphic presentation of the difference between peace costs and war costs reproduced on this page is from the *Chicago Daily Tribune* for December 27, 1934.

THE DIFFERENCE BETWEEN PEACE AND WAR COSTS

What the money spent on one foreign war would do if applied to peaceful purposes.	*What the money spent on one war did when applied to warlike purposes.*
 *It would crisscross the continent with boulevards.*	 *It would reclaim all our arid spaces.*
It filled the hospitals with our best youth.	*It broke many a mother's heart.*
 *It would supply free education.*	 *It would supply the nation with power.*
It put a premium on falsehood.	*It raised war profiteering to a science.*
It would reforest all denuded timber lands.	 *It would build ship canals.*
It whitened alien fields.	*Our hospitals still are filled with veterans.*
It would modernize all railways.	 *It would supply tractors to all farmers.*
It destroyed beautiful works that cannot be replaced.	*It gassed and shell shocked countless boys.*
 *It would give us a merchant marine without which we cannot be independent.*	 *It would eliminate the slums and afford wholesome housing for everybody.*
It sowed the seeds of hate and settled nothing.	*It was an orgy of wastefulness.*
It would supply free hospitalization for the poor.	*It would provide every seaport with a well protected harbor.*
It led to gigantic destruction.	*The war led to a moral and ethical slump.*
It would build landing fields and mooring piers for air routes.	*It would provide old age insurance which would rob the creeping years of their terrors.*
Our national debt jumped from two to 24 billions.	*And the war's aftermath will be a burden for generations.*

The Crime Conference at Washington, December 10-13

SOME 600 experts in criminology, from sheriffs to judges, foregathered at the Federal Department of Justice on the night of December 10 for the opening of a three-day crime conference called by Attorney General Homer S. Cummings.

The immediate purpose laid down by President Roosevelt is (1) to provide a constantly improving administrative structure that will tie together every crime-preventing, law-enforcing agency of every branch of government—the Federal Government, the 48 state governments, and all the local governments, including counties, cities and towns, and (2) to interpret the problem of crime to the people—to build up a body of public opinion, which is not now sufficiently active or alive to the situation.

The President said that in many instances the bandits were better equipped and organized than the officers, owing to lack of coordination among local agencies, lack of facilities for training skilled men for the work of detection, apprehension and prosecution, and lack of facilities for the study and supervision of certain types of criminals capable of rehabilitation.

The Attorney General sketched the situation that forces officers of the law to engage in pitched battles with "the desperate implements of modern warfare" on public highways and in railroad stations.

Henry L. Stimson said that the recent success of the Federal agents in kidnaping cases has caused some people to suggest that the proper remedy is for the Federal Government to take over generally the work of apprehending conspicuous criminals, but that he hoped that this idea would not be pushed at the conference. The great bulk of crime is local, he continued, and the responsibility for its apprehension and punishment should remain on the localities where it occurs. The danger in loading this work on the Federal Government is in weakening the sense of responsibility of the local officials and is overwhelming the Federal system. He reminded the audience of the prohibition fiasco.

J. Edgar Hoover, Director of the Division of Investigation of the Department of Justice, called attention to the intricate system of fraternization among lawbreakers, by which one gives aid to another, welding them into a nation-wide brotherhood and sisterhood. He called for absolute cooperation and closely knit programs of detection and apprehension worked out among all law-enforcement agencies.

Professor Thorstein Sellin of the University of Pennsylvania estimated that serious crime cases in 1933 numbered 1,300,000, and that in three-quarters of them no one had been brought to justice.

At the final session on December 13, nine resolutions, boiled down from a total of 110 that had been introduced, were unanimously accepted. The gist of these is given below:

1. Make the crime conference a continuing organization, meeting every two years or oftener.
2. Establish at Washington a national scientific and educational center for the training of personnel.
3. Attain cooperation of all law-enforcing agencies, with the task of crime suppression still largely local.
4. Discover underlying factors in child delinquency.
5. Discourage unlawful methods of dealing with industrial and racial conflicts.
6. Continue use of parole system honestly applied.
7. Improve criminal procedure by state legislatures in accordance with the model code of the American Law Institute, approved by American Bar Association and Association of American Law Schools.
8. Oppose dramatization of crime.
9. Remove unsafe jail conditions, possession of firearms by irresponsible persons, protection given criminals by persons in high position, abuse of bail, evils in criminal law administration, and refer this to the permanent organization that may result from this conference.

International Housing and Town Planning Congress, London, July, 1935

ANNOUNCEMENT is made by G. L. Pepler, Honorary Secretary, that the fourteenth International Housing and Town Planning Congress will be held in London, England, during the third week of July, 1935. Mr. Pepler's letter lists three principal subjects for discussion:

1. Rehousing the People
2. Positive Planning
3. Planned Rural Development

The President of the Congress will be the Rt. Hon. Sir Edward Hilton Young, M.P., British Minister of Health; the Vice-Presidents will be the Rt. Hon. Neville Chamberlain, M. P., the Rt. Hon. Arthur Greenwood, M.P., the Rt. Hon. the Lord Mayor of London, and the Chairman of the London County Council.

"The new developments in housing and town planning in England are of the greatest interest and importance," writes Mr. Pepler, "and facilities have been promised that will make the Congress one of the most valuable that the Federation has held."

The Organizing Secretary of the International Federation for Housing and Town Planning is H. Chapman, 25 Bedford Row, London, W. C. 1.

Another international meeting to be held in Europe in 1935, as previously announced in THE AMERICAN CITY, is the Congress of the International Housing Association, which is scheduled for Prague some time in June. The General Secretary is Professor Franz Schuster, Hansa-Allee 27, Frankfort a/M, Germany.

The Municipal Bond Market

"THE upward surge of municipal bond values, now at the highest levels reached in thirty years or more," says *The Bond Buyer* in its issue of December 15, "is a phenomenon of great importance to municipal debtors. . . . In the twelve months ended the first of this month, a price index based on the bonds of twenty large cities indicated a reduction in the interest rate for long-term money of more than 1½ per cent."

The following are some typical sales of new issues, as reported in the December issues of *The Bond Buyer:*

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$100,000	Morristown, Pa., Borough	1.75	1-5 Ser.	1.69
259,000	Hamilton Co., Ohio, Relief	1.75	1.83 Avg.	1.70
200,000	Fitchburg, Mass., Adjustment Loan	2	1-5 Ser.	1.87
161,800	Franklin Co., Ohio, Relief	2	1.75 Avg.	1.96
100,000	Ogdensburg, N. Y., Relief	2.5	7.5 Avg.	2.46
515,000	Reading, Pa., Water	4	6 Avg.	2.80
110,000	Hampton, N. H., Sewage Disposal	4	5.5 Avg.	2.89
1,000,000	Rochester, N. Y., Water	2.5	1-8 Ser.	2.31
115,000	Watertown, Mass., High School	2.5	5.33 Avg.	2.42
500,000	Lancaster, Pa., Funding, Refunding	2.75	11 Avg.	2.57
6,309,000	Boston Metropolitan Distr., Mass., District	3	17.33 Avg.	3.18
100,000	Decorah, Iowa, School	3.25	12.83-14.16 Op.-Avg.	3.24
500,000	Kenosha Co., Wis., Relief	3.5	?-10.5 Op.-Avg.	3.49
253,032	Eastchester, N. Y., Street Assessment	3.60	8.5 Avg.	3.595
205,000	Cedarhurst, N. Y., Sewer	4	11.66 Avg.	3.62
959,000	Eureka, Calif., Water	4	15 Avg.	3.66
100,000	Bedford, Va., Electric Plant, Refunding	4	5.83 Avg.	3.80
260,000	Trenton, N. J., Water Improvements	4	1-13 Ser.	3.82
445,000	Jacksonville, Fla., Refunding	4	12.66	3.83
200,000	Portland, Ore., Improvement	5	3-10 Opt.	3.84
278,000	Linden, N. J., Refunding	4	6.33 Avg.	3.86
2,900,000	New York, N. Y., Municipal Purposes	4	2.26	3.90
250,000	Altoona, Pa., School	4	3.83	3.91
100,000	Goshen, Ind., Water Works Revenue	4	9 Avg.	3.92
675,000	New Brunswick, N. J., Funding	4	9.5	4.23
997,000	Norfolk, Va., General Improvements	4.5	11.66 Avg.	4.31

Water Rates and Service Charges, Installation Charges, Hydrant Rentals and Sprinkler Costs—IX

Abstracts of Water Department and Company Reports

Ann Arbor, Mich.

Population	27,000
" served	36,000*
Number of services	7,574
" " meters	7,574
" " hydrants	432
Miles of water main	107.06

* Including students of University of Michigan.

The meter rates for water now in force, which were recommended by the Engineering Rate Commission in 1920, are as follows:

First 1,500 cu. ft. (11,250 gals.) per quarter-year, supplied through a single meter, 15c per 100 cu. ft. (20c per 1,000 gals.).
Next 98,500 cu. ft. (738,750 gals.) per quarter-year, through a single meter, 9c per 100 cu. ft. (12c per 1,000 gals.).
All in excess of 100,000 cu. ft. (750,000 gals.) per quarter-year, through a single meter, 6c per 100 cu. ft. (8c per 1,000 gals.).

A discount of 10% is allowed on all bills rendered at the above rates when they are paid on or before the 10th of the month in which they are due. A minimum charge of $1.50 is made to each customer whose net bill for the quarter-year is less than this amount.

Services are originally paid for by the property owner. The charge for a ¾" tap in the city main on a dirt street is $25.00, and $35.00 for the same kind of tap in a paved street. The cost of taps over ¾" in size is billed to the property owner, charging time and materials. All services from the main to the curb box are maintained by the Water Department, and no work is done on the property owner's side of the curb stop by the Department.

A charge of $2,000 a month is made by the Water Department as a general service charge to the city. There is also a charge of $7.50 per year per fire hydrant, and a charge of $4.00 per year per flush-tank connection. The general service charge covers all the service rendered to the community as a whole. This charge was made originally in 1920, applying to the then existing distribution system. When new mains are laid by the Board of Water Commissioners at the request or with the approval of the Common Council, the general service charge is increased at the rate of $400.00 per year per mile of 6" main, and at higher rates for mains larger than 6", by adding $100.00 per mile per year for each 2" increase in diameter over 6". The hydrant and flush-tank service charges cover the inspection, maintenance and repairs, and the interest, and the depreciation on the investment in the hydrant and in flush-tank connections.

A standby charge of $25.00 per year, payable quarterly in advance, is made for private fire sprinkler services.

H. H. Caswell,
Manager, Water Department.

Astoria, Ore.

Population	10,349
" served	Unknown
Number of services	2,702
" " meters	2,622
" " hydrants	228
Miles of water main	42.8

The following water rates became effective January 1, 1934, with the provision that no special rates should be made to manufacturers for the use of water and, further, that water users outside the city limits must be metered and be charged 1½ times the meter rates for water used inside the city limits, which are:

First	1,000	gals.	per	1,000	gals.	$1.00	1,000	gals.	$1.00
Next	2,000	"	"	"	"	.50	3,000	"	2.00
"	2,000	"	"	"	"	.40	5,000	"	2.80
"	5,000	"	"	"	"	.35	10,000	"	4.55
"	20,000	"	"	"	"	.30	30,000	"	10.55
"	20,000	"	"	"	"	.25	50,000	"	15.55
"	20,000	"	"	"	"	.20	70,000	"	19.55
"	30,000	"	"	"	"	.15	100,000	"	24.05
"	50,000	"	"	"	"	.10	150,000	"	29.05
"	50,000	"	"	"	"	.09	200,000	"	33.55
"	300,000	"	"	"	"	.08	500,000	"	57.55
"	500,000	"	"	"	"	.07	1,000,000	"	92.55
Over	1,000,000	"	"	"	"	.06			

Applications for water service are made at the Water Office, and connections are made by a licensed plumber, except that the actual laying of service pipes and the making of taps and installation of meters is done by the Water Department and charged to the consumer at the following rates:

Size of Pipe	Unpaved Street	Paved Street	Cost of each Additional Foot in Excess of 15 Feet: Unpaved Street	Paved Street
½"	$16.00	$28.50	$0.20	$0.70
¾"	18.00	30.50	22	75
1"	22.00	34.50	27	80

Where it is necessary to cut concrete sidewalks and repair them for the purpose of installing a curb cock, an additional payment of $5.00 is required. Water meters may be bought through the city at cost plus 5%, and repairs to privately owned meters are made by the Water Department at cost plus 10%. All meters installed in the street must be set in meter boxes of a standard design adopted by the Water Department. The original cost is paid by the property owner, and the box is thereafter maintained by the city.

In addition to the regular water meter rates, the following fixed monthly service charge is made:

⅝" meter	$ .25
¾" "	.35
1" "	.50
1¼" "	.60
1½" "	.70
2" disk	.80
2" compound meter	1.00
3" " "	2.00
4" " "	3.20
6" " "	6.50

Where meters are owned privately, the above charges are not made. The amended ordinances effective December 18, 1933, stated that: "Beginning with the meter bills for January, 1934, no rental charges shall be made for meters on any water service connections where the property owner and/or water consumer has previously paid in rentals for his meter on such water service connections an amount equal to the current price to the city of the meter in use, plus 10% thereof."

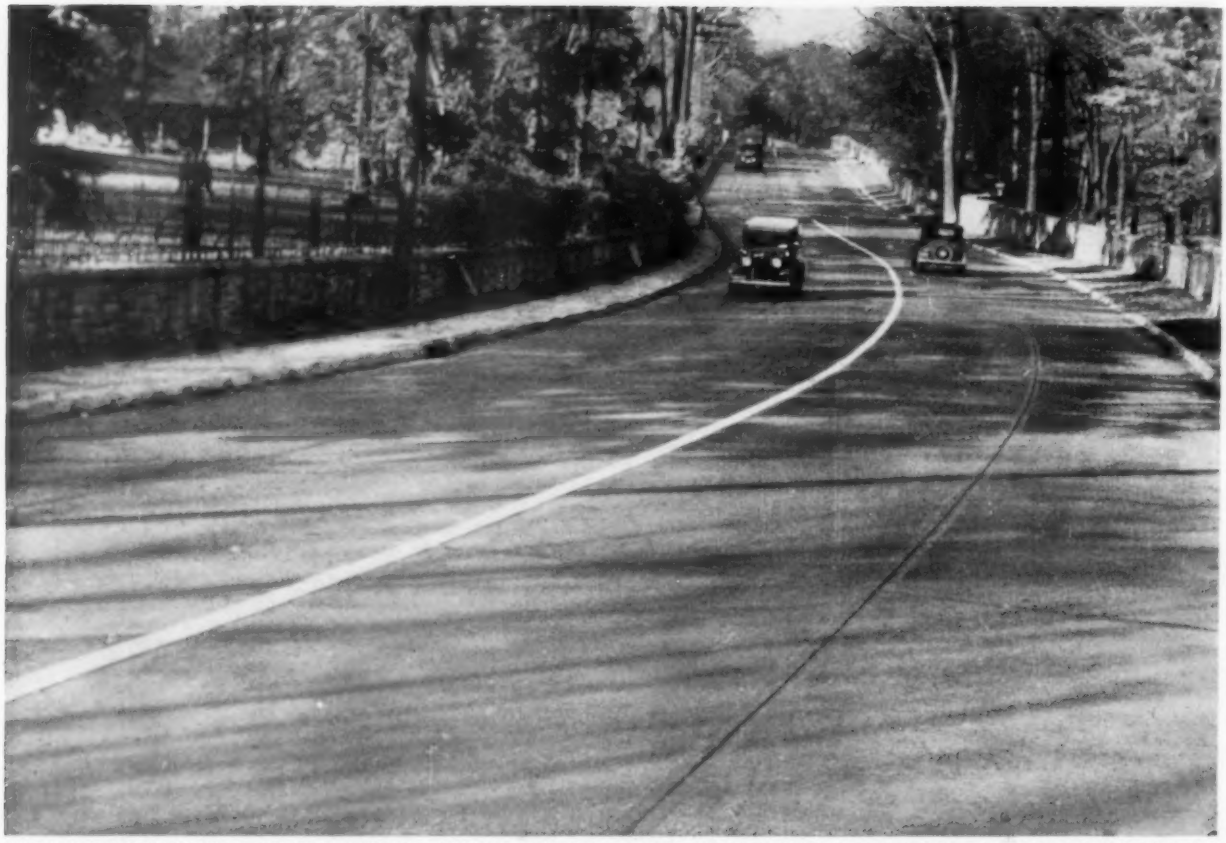
There is no charge to the city for public fire hydrants and no separate charge for private fire hydrants other than the regular meter rates.

H. M. McCallister,
Superintendent, Water Department.

Webster, Mass.

Population	13,000
" served	12,800
Number of services	1,671
" " meters	1,581
" " hydrants	288
Miles of water main	29.0

Certain flat rates have been established for Webster, but when the annual rate for fixtures amounts to $7.00 or more, meters must be installed. The rates for metered water are as follows:



UNRETOUCHED PHOTO, ALBANY POST RD., IRVINGTON, N.Y.—NOTE GRAY COLOR OF SLABS AND EMPHASIS OF WHITE LINE

Color Brings Additional Safety to Concrete Roads

Emulsified Carbon Black imparts a rich gray color;
enhances the safety of Concrete Pavements . . . .

ELIMINATES EYE FATIGUE FROM SUN GLARE
MINIMIZES REFLECTION FROM HEADLIGHTS
ACCENTUATES WHITE LINES AT ALL TIMES

Build Safety, Comfort, Attractiveness into roadways with

EMULSIFIED CARBON BLACK

BINNEY & SMITH CO.
41 EAST 42 ST., NEW YORK
HiBlak

GODFREY L. CABOT, INC.
77 FRANKLIN ST., BOSTON
CHARON

Water takers of less than 20,000 cu. ft.							20c	per	100	cu. ft.
20,000 cu. ft. and not exceeding					66,666	cu. ft.	18c	"	"	"
66,666	"	"	"	"	160,000	" "	16c	"	"	"
160,000	"	"	"	"	266,666	" "	14c	"	"	"
266,666	"	"	"	"	400,000	" "	13c	"	"	"
400,000	"	"	"	"	533,333	" "	12c	"	"	"
533,333	"	"	"	"	666,666	" "	10c	"	"	"

Special rates are made to customers of more than 666,666 cu. ft.

Applications for the use of water are made at the office of the Water Department by the owner of the property. The service pipe from the main pipe to the sidewalk line opposite the point of connection is laid at the expense of the Water Department, the remaining portion at the cost of the property owner. This charge must be paid before water is turned on. Water takers are required to provide a stop and waste cock located inside the building.

The annual minimum rate for metered services is $7.00.

There is no charge for public fire hydrants and a charge of $12.00 per year is made for private fire hydrants. There is no charge for sprinkler service except the cost of installing the main from the street to the building.

S. G. WYLIE,
Superintendent, Webster Water Works.

Ridgewood, N. J.

Population	21,269
" served	21,269
Number of services	5,688
" " meters	5,660
" " hydrants	528
Miles of water main	97.0

The village of Ridgewood supplies the following communities: Ridgewood, 12,570; Glenrock, 4,433; Midland Park, 3,766; Hohokus, 500; total population, 21,269.

All services are metered and water used is billed at the following rates:

First 100,000 gals. per quarter, or any part thereof, 30c per 1,000 gals.
Total for 100,000 gals. $30.00
In excess of 100,000 gals. and under 200,000 gals. per quarter, 25c per 1,000 gals.
Total for 200,000 gals. 55.00
In excess of 200,000 gals. and under 300,000 gals. per quarter, 20c per 1,000 gals.
Total for 300,000 gals. 75.00
In excess of 300,000 gals. per quarter, 15c per 1,000 gals.

The service charge is based on the size of the meter as follows:

⅝" meter	$1.50	per	quarter
¾" "	2.00	"	"
1" "	2.50	"	"
1¼" "	3.00	"	"
1½" "	3.50	"	"
2" "	4.00	"	"
Sewer flush tank con	.50	"	"

Upon receipt of application for water service the Water Department or its agent makes the complete service installation, the Department paying for the tapping of the main and the service line from the main to the curb, the curb stop cock and curb box. The remainder of the service connection is placed by the Department at the owner's expense, payable in advance. Any charges for permission to open a street must be paid in advance by the applicant. Whenever a tap is made through which regular service is not immediately desired, the applicant must bear the entire expense of tapping the main, laying and maintaining the service pipes, couplings and connections, but is entitled to a refund whenever regular service is begun.

In order to equitably distribute the cost of mains in communities supplied by the village of Ridgewood, an inch-foot charge is made to each municipality served each year at the rate of 67/100 of a cent per inch-diameter per foot length of distribution and transmission mains serving that municipality. This is computed by separating the piping system into distribution and transmission mains and determining the aggregate number of inch-feet in the distribution and transmission mains, eliminating all mains less than 6 inches in diameter. All distribution mains located entirely within the boundary of each municipality and serving only that municipality are chargeable to that municipality at the inch-foot rate. All mains 8 inches and larger supplying more than one municipality are called transmission mains and are charged at the inch-foot rate according to the following method: The aggregate charge for transmission mains at the inch-foot rate is distributed to the several municipalities to which they supply water in proportion to the population of those municipalities as listed in the latest Federal Census. The aggregate annual charge for each municipality is then found by taking the sum of the inch-foot charge for the distribution mains within a municipality and the proportion of the inch-foot charge for the transmission mains applicable to that municipality.

Each municipality pays a hydrant charge of $6.00 per year for each public hydrant and pro rata for fractions of a year.

A discount of 3 per cent is allowed on all charges to private consumers for water furnished by meter, provided the charges are paid within ten days after the bill is rendered. No discount is allowed on charges for service installations, materials furnished, repairs or other charges. If a bill remains unpaid for a period of 30 days or more after mailing or presentation, notice is served or mailed to the consumer that unless the bill is paid within 7 days from date, the water supply will be discontinued. When the water is turned off under such conditions, it remains so until the bill is paid plus $2.00 to cover the cost of the call to again establish service.

J. A. CARR,
Superintendent, Water Department.

Aberdeen, Wash.

Population	21,000
" served	21,500
Number of services	5,785
" " meters	950
" " hydrants	325
Miles of water main	112.0

All water meters are read monthly and bills rendered according to the following rates:

First	500	cu. ft. or fraction thereof					$1.50			
Next	500	" "					30c	per	100	cu. ft.
"	1,400	" "					25c	"	"	"
"	1,100	" "					20c	"	"	"
"	2,500	" "					15c	"	"	"
"	29,000	" "					10c	"	"	"
"	19,000	" "					7c	"	"	"
"	46,000	" "					6c	"	"	"
Over	100,000	" "					5c	"	"	"

All users of water for industrial purposes who use over 25,000,000 gals. per month, at an average daily use, are charged the following rates, which are subject to 25% discount.

Block of Consumption Million Gallons Monthly	Block Rate per 1,000 Gallons	Total to End of Block
First 25	$ .025	$625.00
25 to 50	.023	1,200.00
50 " 75	.020	1,700.00
75 " 100	.0175	2,137.50
100 " 125	.016	2,537.50
125 " 200	.014	3,587.50
200 " 275	.012	4,487.50
275 " 325	.0105	5,012.50
325 " 400	.009	5,687.50
400 " 450	.0075	6,062.50
450 " 500	.006	6,362.50
All over 500	.005	

Application for water service is made on a form furnished by the Water Department. No service connections less than ¾" in size are installed, and that is the standard size tap for all residences. The fees for the installation are as follows: ¾" service pipe in an unimproved street or alley, $6.00; gravel street or alley, $8.00; paved street or alley, $20.00; cost of each additional foot in excess of 20 ft. in an unimproved street or alley, 15c; gravel street, 20c; paved street, 50c. For a 1" service line in an unimproved street or alley, $8.00; gravel street or alley, $10.00; paved street or alley, $22.00; cost of each additional foot in excess of 20 ft. in an unimproved street or alley, 20c; gravel street, 25c; paved street, 55c. When one single water main exists in any street or alley, all charges for laying a ¾" or 1" service line are calculated as if the water main was located in the center of the street, in order that a uniform charge may be made to the property abutting on opposite sides. For sizes larger than 1", the actual costs of labor and materials in laying the service and repairing the walks, roadways or pavement, are charged. In cases of connections extending along a street or alley on which there is no main, the cost of labor and material as estimated by the Superintendent must be paid by the person applying for the installation before the work of connecting the main with the property is begun.

A ready-to-serve charge for different size services for fire protection, either metered or flat rate, is made as follows:

For service	1½"	diameter			$1.50	per	month
" "	2"	"			2.00	"	"
" "	3"	"			2.50	"	"
" "	4"	"			3.00	"	"
" "	6"	"			5.00	"	"
" "	8"	"			7.00	"	"
" "	10"	"			10.00	"	"

The above rates apply to premises which obtain all or the major portion of all water used on the premises for domestic and commercial purposes from the city. Where the premises require more than one fire protection service, the first service is furnished at the above rates, and each additional service at

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On a fuel cost of less than a dollar a day, Amador County does road maintenance work with this "Caterpillar" Diesel Tractor near Jackson, California.

"THE 'CATERPILLAR' DIESEL TRACTOR HAS CUT OUR FUEL COSTS 70%"

—SAYS A COUNTY SUPERVISOR WHOSE ROAD WORK WAS FORMERLY DONE WITH A GASOLINE TRACTOR. OTHER OWNERS, EVERYWHERE, REPORT SIMILAR SAVINGS

"It costs only half as much to fill the fuel tank, and a tankful lasts twice as long"—"Fuel for our tractor costs less than food for the driver"—"Our big 'Caterpillar' Diesel costs less for fuel than three smaller gasoline tractors" . . . these are terms in which owners express their delight over the economy of the "Caterpillar" Diesel. For their economy—plus rugged power, sure traction and faithful performance—"Caterpillar" Diesel Tractors have won a foremost place on today's earth-moving, contracting, road-building jobs. They can reduce your power costs. Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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double the above rates, for their respective sizes each. Where a property or premises does not obtain all or the major portion of water used on the premises for domestic or commercial purposes from the city, the following rates for a fire service connection, either metered or flat rates, are made for each fire connection:

1½"	$3.50 per month
2"	5.00 " "
3"	7.00 " "
4"	9.00 " "
6"	15.00 " "
8"	21.00 " "
10"	30.00 " "

S. C. WATKIN,
City Engineer and Water Superintendent.

Fitchburg, Mass.

Population	40,000
" served	38,000
Number of services	6,734
" " meters	6,216
" " hydrants	1,007
Miles of water main	96.25

The charge for metered water for all purposes, used at any one manufacturing plant, business block, tenement block or house, is 18c per 100 cu. ft. for the first 5,000 cu. ft. or less per quarter; for the next 50,000 cu. ft. or less per quarter, 7c per 100 cu. ft.; and all in excess of 55,000 cu. ft. per quarter, 4c per 100 cu. ft. The commissioner reserves the right to place a water meter on the pipes of any consumer at the expense of the city. Every consumer metered pays a minimum charge annually governed by the size of the meter. These charges are as follows:

⅝" meter	$ 5.00
¾" "	10.00
1" "	12.00
1½" "	18.00
2" "	25.00
3" "	35.00
4" "	60.00
6" "	100.00

There are no hydrant rentals nor sprinkler charges.

A. W. F. BROWN,
Superintendent, Fitchburg Water Works.

Westfield, Mass.

Population	19,775
" served	19,000
Number of services	3,175
" " meters	216
" " hydrants	450
Miles of water main	64.163

The meter rates are as follows:

First 10,000 cu. ft. or less per quarter, 15c per 100 cu. ft. All in excess of 10,000 cu. ft. per quarter, 5c per 100 cu. ft.

When the total use for one independent premises amounts to 300,000 cu. ft. or more in any one quarter, the entire quantity will be charged at 5c per 100 cu. ft., with a discount of 10% for all bills paid by the 15th of the month in which the bill is rendered. Business and industrial buildings of more than one section, and adjoining or adjacent buildings under one independent ownership as a plant, if not separated by a street or by other buildings or premises under another ownership, are considered as one independent premises.

The minimum quarterly charges for water for single dwellings and double house or block or two or more ground-floor, single-tenement sections, is $2.50 per quarter for each tenement; for tenement houses, apartment blocks, etc., the minimum charge is $2.50 for each tenement or apartment; for business blocks, manufactories or other industrial plants, elevators and motors, the bill for each independent premises is not less than $3.00 per quarter.

The quarterly charge for meters supplied by the city and installed within the building is as follows:

⅝" meter	$ .50
¾" "	.80
1" "	1.25
1½" "	2.00
2" "	2.50
3" "	4.50
4" "	9.00

Rentals for larger size meters are proportionate to the cost of meters and the cost of installation. For unusual cases, where it is necessary to locate the meter in the street or upon premises outside of buildings, the amount of rental is 10% of the cost of the meter and the cost of its installation.

There is no charge for public or private fire hydrants or for sprinkler service connections.

OREN E. PARKS,
Superintendent, Board of Public Works.

Danville, Va.

Population	27,532
" served	30,000
Number of services	No Record
" " meters	5,646
" " hydrants	367
Miles of water main	61.9

The water rates which are applicable to all consumers within the city limits are:

First	900 cu. ft. per mo.	75c
Next	10,000 " " " "	12c per 100 cu. ft.
"	10,000 " " " "	10c " " " "
"	10,000 " " " "	8c " " " "
Over	30,900 " " " "	6c " " " "

The minimum charge is 75c per month per meter. Unless the water bill is paid within 10 days from the date due or on or before the expiration date shown on the bill, 10% is added to the amount of the bill.

The water rates for consumers outside the city limits are:

First	10,000 cu. ft. per mo.	15c per 100 cu. ft.
Next	10,000 " " " "	12c " " " "
Over	20,000 " " " "	10c " " " "

A minimum charge of $1.00 per month per meter is made in this classification, and 10% is added to the bill if not paid on date due.

Upon application by a prospective consumer, the Department of Water, Gas and Electricity installs the service connection, making the following charges, payable in advance: on unpaved streets, a charge of $25.00 for each ¾" or smaller service connection, and a charge of $35.00 each on paved streets; on unpaved streets, a charge of $35.00 for each 1" service connection, and a charge of $45.00 each on paved streets. When such charges are paid in advance by the plumber applying, the Water Department makes the connection from the main to the meter or property line furnishing the material and labor. Connections for fire purposes and for services in excess of 1" in size are made by the Department, with the property owner bearing the entire expense, including the expense of replacing all street paving.

The rental charge for public fire hydrants is $50.00 each per year. There is no charge for either sprinkler services or private fire hydrants.

LYLE R. MCCLUNG,
Engineer, Water, Gas and Electric Department.

Cairo, Ill.

Population	13,200
" served	13,200
Number of services	2,759
" " meters	876
" " hydrants	330
Miles of water main	35.0

The meter rates are as follows:

First	1,000 cu. ft. per month,	29c per 100 cu. ft
Next	19,000 " " " "	15c " " " "
All over	20,000 " " " "	9c " " " "

These rates and all rates given below, except the municipal fire hydrant rate, are subject to a 10% cash discount for payment within 30 days.

Municipal fire service is furnished through fire hydrants billed at $34.00 each per year.

Hydrants on private property for fire protection and equipped with fittings for a hose not over 2½" in diameter are billed at $49.21 each per year. The charges for fire service including a sprinkling system are as follows:

6" main pipe	$82.03
4" " "	49.21
3" " "	32.81
2" " "	24.60
1½" " "	16.40
1¼" " "	13.13
1" " "	9.84

C. M. ROOS,
Vice President—Manager, Cairo Water Co.

Reprints To Be Available

Water Rates and Service Charges, etc., which have been published in The American City this year, and in The Municipal Index, are being reprinted in pamphlet form and will be available at $1 each in about a month. The combined reports cover over 200 of the larger cities and water works systems of the United States.

1912 Pine Street, Sewickley, Pennsylvania, as it looked in 1912 when it was Tarvia-built.

1935 Pine Street has "grown up" in 23 years, but the Tarvia pavement has not changed.

The Barrett Company Tarvia organization, with its 31 years of successful experience in low-cost road-building, offers practical, money-saving cooperation to road officials, particularly those whose 1935 budgets are limited. Before completing your plans, talk them over with a Tarvia field man. He can show you how to meet immediate and future needs inexpensively — how to get the most miles of smooth, easy-riding, skid-safe road . . . Meet us at Booth 34 Annual Meeting of American Road Builders Association, Willard Hotel, Washington, D.C., January 22-24, 1935.

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated

Planning and Housing

Town Planning and Housing Throughout the World.—By Bruno Schwann, Manager of the German Society for Housing Reform. Published by Ernst Wasmuth, Berlin, Germany. Distributed in the United States by B. Westermann Co., Inc., 13 West 46th St., New York. 280 *pp. text;* 100 *pp. illustrations;* 8½ *x* 12". $12.00.

In one edition and in three languages—German, English, French—this imposing volume presents a survey of town planning and housing in 34 countries. It is an outstanding result of the International Exhibition for Town Planning and Housing held in Berlin in 1931 and has been published on behalf of the German Association for Housing Reform, with the collaboration of experts from the various countries represented. It covers the development and the present status of these matters, also the legislation affecting them. The information for the United States is presented by John Nolen and John Ihlder. The authenticity and scope of the volume and its excellent workmanship command interest and offer valuable service in this wide field.

Modern Housing.—By Catherine Bauer. Houghton Mifflin Company, Boston, Mass. 1934. *XVII* + 331 *pp.* + 48 *pp. of plates.* $5.00 *from* THE AMERICAN CITY.

"If only a small part of the vast energy which was once directed toward individual home-ownership were now organized to demand a realistic program of modern housing—the best dwellings that planners can plan and that labor and materials can build (and we have an abundance of all three)—then there would be an American housing movement indeed."

In this concluding paragraph of the main portion of her book, Miss Bauer has summed up what was doubtless her impelling motive in making available, in this handsome publication, a mass of material which will prove very helpful to all actuated by the ideal set forth.

With the assistance of the Carnegie Corporation and of a fellowship from the New Jersey State Federation of Women's Clubs, Miss Bauer, in preparation for this book, studied the finest examples of European housing in the light of their application to the United States. The chapters are grouped into four principal sections: Nineteenth-Century Cities: A Record of Failure; Gathering Forces; Post-War Housing: Facts and Figures; and Elements of Modern Housing.

In discussing the future of housing in America, Miss Bauer has had the advantage of association with Lewis Mumford and Clarence S. Stein, and she also gives credit for valuable suggestions to Henry Wright, Albert Mayer, Frank Vitolo and Dr. Edith Elmer Wood.

An appendix outlines the histories and achievements of national measures in England, Germany, Holland, Belgium, France, Austria, the Scandinavian countries, and Switzerland. There is also an excellent bibliography and an index.

America Can't Have Housing.—Edited by Carol Aronovici. The Museum of Modern Art, New York. 1934. 78 *pp.; paper cover.* 50 *cents* (*postage additional*).

Under this pessimistic title, in a symposium to which sixteen American and European experts contributed, the attempt is made to show how America *can* have housing of an adequate and worthy kind. Although compiled for the Committee on the Housing Exhibition recently shown at the Museum of Modern Art, the book, as explained in the editor's Foreword, "is not intended primarily as a guide to the material on exhibition. It is rather a statement of the far-reaching and varied social, financial, technological, administrative, legislative and political factors which must be made in our social philosophy and public policy in order to improve the housing condition of the masses of the American people."

Water Supply

From the 1934 Proceedings of the American Society for Testing Materials a 45-page reprint has been made of a paper on "Water as an Engineering and Industrial Material," by Sheppard T. Powell, consulting chemical engineer, of Baltimore, Md. It was presented at the annual meeting of the Society, at Atlantic City, N. J., on June 27, 1934, as the ninth Edgar Marburg Lecture. "The recent trends in all forms of industrial development and expansion have demonstrated the necessity for constructive research in this field. . . . All that industries depending upon public water supplies may reasonably expect is that the raw product shall fall within certain broad specifications. Refined processing for special usage is a function of private management." Current thought on a number of problems is presented, of value to those concerned with industrial applications, power plants, water analysis and detection of impurities, and the lecture is also pertinent to the general water-supply field. 50c. (Apply to the Society, 260 S. Broad St., Philadelphia, Pa.)

National Planning and Public Works

Copies of the 88-page report of the National Resources Board submitted to the President on December 1, excerpts from which are published on pages 39 and 40 of this issue, are obtainable from the U. S. Government at 25 cents per copy. The report covers national planning and public works in relation to natural resources, including land use and water resources.

Copies are also available, from the same source and at the same price, of the 119-page final report of the National Planning Board, submitted to the Federal Emergency Administration of Public Works on August 1, 1934.

Pavements

"Economic Life of Bituminous Pavements" is Number 21 of the Information Series of The Asphalt Institute, issued October 1, 1934. It presents the results of a survey covering all cities in the United States of more than 100,000 population. The detailed city reports are presented in comprehensive tabular form. The life expectancy of a pavement affects certain essentials in a paving program—the details of the bond issue, the maintenance guarantee, the selection of the type of pavement, the long-range planning of such improvements. 8 pp. (Apply to The Asphalt Institute, 801 Second Ave., New York.)

Forestry

Editor Edward J. Meeman of *The Memphis Press-Scimitar* was one of the party of American city officials and publicists who went to Germany in 1933 to study municipal government under the auspices of the Oberlaender Trust of the Carl Schurz Memorial Foundation. What he observed and learned of "'Green Spaces' in German Cities" is told in an article with that title in the November, 1934, issue of *The Rotarian*, and charmingly illustrated. The municipal forests of Germany are amazing in their size, their wildness and their ancient growth; also in their informal beauty. Generally birds do the seeding, but planting of seedlings is employed where necessary. The care and supervision, thinning and cutting, for fire protection, access by good roads; the business management of the forest wood and lumber enterprises; and the esthetic and recreational value of these municipal areas, are dwelt upon by the author, who feels that the German municipal forests are a rebuke and an inspiration to the American visitor. (Apply to Rotary International, Chicago, Ill.)

Planning

Model Laws for Planning Cities, Counties, and States.—By Edward M. Bassett, Frank B. Williams, Alfred Bettman and Robert Whitten. Harvard University Press, Cambridge, Mass. 1935. 137 *pages.* $2.50 *postpaid.*

This new handbook of model laws for planning, zoning, subdivision regulation, and protection of official map is Volume VII of the Harvard City Planning Studies. It discusses principles, and suggests exact phraseology, of alternative proposals for these various types of legislation for cities, counties, regions and states.

The four authors, although agreeing as to the results to be sought, differ as to the methods which they consider to be desirable. Messrs. Bassett and Williams believe in submitting to our legislatures something already understood in principle and essentially familiar in use; Messrs. Bettman and Whitten prefer to give the techniques and procedures of planning more emphatic support in the structure and methods of legislation and of administration in local government.

The first preliminary report to be filed with the National Resources Board by any state planning board is that of the Missouri State Planning Board, which therefore represents a pioneering effort in comprehensive planning on a statewide basis. It is primarily a survey of the present situation in Missouri regarding land use, conservation of natural and human resources, industry, transportation, parks and recreation, roadside development, planning methods and agencies, and CWA and PWA projects. The consultants who directed the work of the technical staff and prepared the report are Harland Bartholomew, of St. Louis, and S. Herbert Hare, of Kansas City. R. W. Selvidge, of the University of Missouri, is the Chairman of the Missouri State Planning Board. 93 photo offset pp. including 25 maps and illustrations, and important statistics. $1.00—the cost of printing. (Apply to the Board, Capitol Bldg., Jefferson City, Mo.)

Public Safety

A manual entitled "Good Driving," published by the Education Division of the National Safety Council, outlines methods of organizing programs of instruction in secondary schools and presents subject matter on various aspects of automobile driving. It was prepared by the Secondary School Committee of the Child Education Section of the Council and has received the cooperation and support of the National Bureau of Casualty and Surety Underwriters. "In some states mere children with no training are legally able to operate high-powered cars, and in no states at the present time have specific agencies been set up for teaching young people how to drive." It is thought possible "that the high schools of the country can do more to cope with the situation in a fundamental way than any other agency that can be brought into action." 43 pp. 25c. (Apply to Education Division, National Safety Council, 1 Park Ave., New York.)

Motion Pictures

"How to Select and Judge Motion Pictures" has been prepared by Worth M. Tippy, Executive Secretary of the Department of the Church and Social Service, of the Federal Council of the Churches of Christ in America, to help people to find decent and worth-while pictures, and to present this information in simple, inexpensive form. Its chapters are: What Is the Motion Picture?; Origin and Growth of the Motion Picture; Skills and Techniques of the Motion Picture Studio; Cinema and Stage; On Judging Motion Pictures; Moral Standards; Social and Spiritual Values in Films; Selection of Pictures for Children; Photoplay Review Services; Shopping for Desirable Pictures; Selection and Block-Booking; Support of Good Pictures. 31 pp. Single copies, 25c; 5 or more to one address, 20c each; 25 or more to one address, 15c each. (Apply to the author at 105 E. 22d St., New York.)

"Our State Test was Unsatisfactory—

however, since using HTH, we have State approval based on tests of bacteria content, color and taste."

An interview with James J. Buchanan, chairman, Water Commissioners, Town of Northborough, Mass.

A FEW months ago, the Town of Northborough, Massachusetts, incorporated in the year 1766, found itself faced with a serious water supply problem. As in many similar towns, the water system was out of date and State tests showed the quality of the supply to be unsatisfactory. Yet the volume of water handled did not justify any considerable investment in treating equipment.

Here's how James J. Buchanan, chairman of the Water Commissioners, describes the problem and what he did to solve it with a minimum expenditure: "Our conditions were particularly bad at the time that we started the use of HTH," Mr. Buchanan says. "We have a gravity system with no filter and due to past neglect and the age of the system, which employs concrete mains laid over 50 years ago, our State test was unsatisfactory."

"Since the installation of a Chlor-O-Feeder, however, and the use of HTH in its operation, we have changed a very bad condition to one in which we now have State approval based on tests of bacteria content, color and taste. We find also that our pipe system is gradually clearing of the slime accumulation of years and we attribute this also to the use of HTH."

The economical treatment of small water supplies and many other useful applications for HTH are described in detail in our 72-page book "Hypo-Chlorination of Water." If you have not yet received your free copy of this book, write us.

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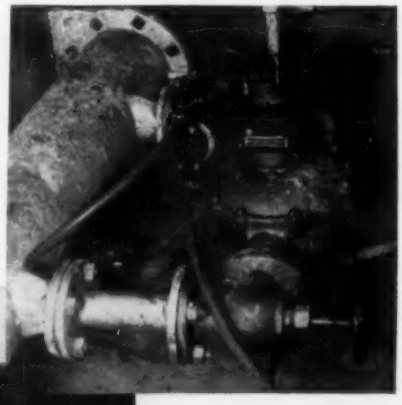
Soda Ash . . . Liquid Chlorine . . . Bicarbonate of Soda . . . HTH and HTH-15 . . . Caustic Soda . . . Bleaching Powder . . . Ammonia, Anhydrous and Aqua . . . PURITE (Fused Soda Ash) . . . Solid Carbon Dioxide.



Chlor-O-Feeder installation at Northborough, Mass. feeding HTH solution in step with flow of water. The equipment is installed underground, tapped into an open main on a cement pipe 52 years old.

Reservoir supplying water to the Town of Northborough, Massachusetts.

Real Estate Taxation

The second and final report of the first appointive Cook County Assessor under the assessment law of 1932, has been published (November, 1934) in a pamphlet entitled "Assessments of Real Estate and Personal Property in Cook County, Illinois, for the Tax Years of 1931-1932-1933." It contains a summary of the assessment reorganization and improvements in assessment procedure, standards and practices which have been established in Cook County, together with statistical summaries on property assessments and taxes in the county. A program of specific recommendations is also presented, looking forward to further improvement in assessment and fiscal administration in Cook County. (Apply to J. L. Jacobs, Cook County Assessor, Chicago.)

Playgrounds

A suggested standard based upon the space required for the facilities, apparatus and game areas which are considered essential to the well-balanced playground program is given in "Space Requirements for the Children's Playground," published by the National Recreation Association and reprinted from *Recreation*, August and September, 1934. 24 quarto pp. Illustrated. This statement was prepared by George D. Butler, of the staff of the Association, after consultation with Lee F. Hanmer and Clarence Arthur Perry, of the Department of Recreation, Russell Sage Foundation, who developed the play standards included in the reports of the Regional Plan of New York and Environs. (Apply to the National Recreation, 315 Fourth Ave., New York.)

Housing

Three new circulars of the Federal Housing Administration dated November 27, 1934, are available. These cover regulations under Title II of the National Housing Act. Circular No. 1 has to do with Mutual Mortgage Insurance, Circular No. 2 with Property Standards, and Circular No. 3 with Insurance of Mortgages on Low-Cost Housing Projects. (Apply to the F.H.A., at Washington, D. C.)

An 8-page leaflet published by the National Bureau of Standards describes the "Services of the National Bureau of Standards to the Home Building Industry." It was prepared to supplement an exhibit of home building materials which the Bureau recently had on display in New York at an exposition sponsored by the New York City Housing Authority. (Apply to the Bureau, U. S. Department of Commerce, Washington, D. C.)

In *Public Health Reports* (published by the United States Public Health Service) for November 2, 1934, there is an article on "The Relation Between Housing and Health," by Rollo H. Britten, Senior Statistician, U S. Public Health Service. This authoritative fact-finding presentation, indicating that poor housing is a public-health as well as a sociological problem, deals with the housing health hazards revealed by a study of water supply, sewage disposal, sources of fly breeding, congestion, ventilation and light, structural conditions, and fire dangers. Important notes and references are given. The cooperative endorsement of the movement for the elimination of insanitary housing, and the rehabilitation of family environment, is definitely stated by Horatio B. Hackett, Director of Housing, and Hugh S. Cumming, Surgeon General, U. S. Public Health Service, 13 pp. of the issue. (Apply to Housing Division, Public Works Administration, Washington, D. C.)

Other Reports Received

ARKANSAS.—Arkansas State Planning Conference, Proceedings, July 10, 11, 1934. 155 pp.

ASBURY PARK, N. J.—"Then and Now," 28 comparative studies between conditions under the old commission government and the new, present, city manager government. Pocket size. 36 pp.

HUNTINGTON PARK, CALIF.—Annual Report, City Clerk, 1933-34. 40 mimeographed pp.

LOS ANGELES, CALIF.—Annual Report, Board of Public Works, year ending June 30, 1934. 110 quarto pp. and folding map.

NEW YORK CITY.—Annual Report, Board of Water Supply, 1933. 79 pp. plus folding tables.

PALTO ALTO, CALIF.—Annual Report of City, 1932-33. 102 pp.

PHILADELPHIA, PA.—Annual Report, Art Jury, 1933. 37 pp.

PORTLAND, ORE.—Annual Report, Auditor, year ending November 30, 1933. 186 pp.

SEATTLE, WASH.—Annual Report, Water Department, 1933. 42 pp. plus maps.

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

JANUARY 10-12.—WASHINGTON, D. C.
American Engineering Council. Annual meeting. Executive Secretary, Frederick M. Feiker, 744 Jackson Place, Washington, D. C.

JANUARY 12.—PROVIDENCE, R. I.
Rhode Island Town and City Clerks' Association. Annual meeting. Secretary, Alice A. Tonge, Deputy Town Clerk, Town of Warwick, Apponaug, R. I.

JANUARY 16-18.—NEW YORK.
American Society of Civil Engineers. Annual meeting. Secretary, George T. Seabury, 33 West 39th Street, New York.

JANUARY 21-23.—WASHINGTON, D. C. (100)
American Society of Landscape Architects, Inc. Annual meeting. (Hotel Mayflower.) Executive Secretary, Bradford Williams, 9 Park Street, Boston, Mass.

JANUARY 21-25.—LAFAYETTE, IND. (800)
Purdue Road School. Annual session. Address: Prof. Ben H. Petty, Engineering Extension Department, Purdue University, Lafayette, Ind.

JANUARY 22-25.—NEW YORK.
American Institute of Electrical Engineers. Annual winter convention. National Secretary, H. H. Henline, 33 West 39th Street, New York.

JANUARY 22-25.—WASHINGTON, D. C.
American Road Builders' Association. Convention and exhibit. (Willard Hotel.) Engineer-Director, Charles M. Upham, 938 National Press Building, Washington, D. C.

JANUARY 27.—BOSTON, MASS.
Massachusetts State Association of Selectmen. Annual meeting. Executive Secretary, Harris A. Reynolds, 4 Joy Street, Boston, Mass.

JANUARY 28-30.—BUFFALO, N. Y.
American Society of Heating and Ventilating Engineers. Annual meeting. (Hotel Statler.) Secretary, A. V. Hutchison, 51 Madison Avenue, New York.

JANUARY 28-30.—WASHINGTON, D. C. (400)
Associated General Contractors of America, Inc. Annual convention. Managing Director, E. J. Harding, 222 Munsey Building, Washington, D. C.

JANUARY 31-FEBRUARY 1.—ASBURY PARK, N. J.
Eastern Safety Conference. (Berkeley-Carteret Hotel.) Manager, Fred M. Rosseland, 24 Branford Place, Newark, N. J.

FEBRUARY 6-8.—INDIANAPOLIS, IND. (200)
National Paving Brick Association. Annual meeting. Managing Director, G. F. Schlesinger, 1245 National Press Building, Washington, D. C.

FEBRUARY 12-14.—ANN ARBOR, MICH. (500)
Conference on Highway Engineering—University of Michigan. Annual convention. Secretary, R. E. Morrison, University of Michigan, Ann Arbor, Mich.

FEBRUARY 13-15.—BALTIMORE, MD. (500)
Association of Highway Officials of North Atlantic States. Annual convention. Secretary-Treasurer, A. Lee Grover, Secretary, State Highway Commission, Trenton, N. J.

FEBRUARY 18-21.—CHICAGO, ILL.
National School Supply Association. Annual convention. Executive Secretary, J. W. McClinton, 176 West Adams Street, Chicago, Ill.

FEBRUARY 19-21.—NEW YORK CITY. (350)
American Concrete Institute. Annual convention. Secretary, Harvey Whipple, 641 New Center Building, Detroit, Mich.

FEBRUARY 21-24.—WASHINGTON, D. C.
The Public Ownership League of America. Biennial meeting. (Willard Hotel.) Secretary, Carl D. Thompson, 127 North Dearborn Street, Chicago, Ill.

FEBRUARY 23-28.—ATLANTIC CITY, N. J. (7,000)
National Education Association—Department of Superintendence. Annual convention. Executive Secretary, Sherwood D. Shankland, 1201 16th Street, N. W., Washington, D. C.

MARCH 7-8.—INDIANAPOLIS, IND.
American Water Works Association—Indiana Section. Annual meeting. Secretary-Treasurer, B. H. Jeup, 201 State House Annex, Indianapolis, Ind.

MARCH 21-22.—TRENTON, N. J. (300)
New Jersey Sewage Works Association. Annual meeting. (Stacy-Trent Hotel.) Secretary, John R. Downes, Bound Brook, N. J.

MARCH 27-29.—LONDON, ONT. (HOTEL LONDON.)
American Water Works Association—Canadian Section. Annual meeting. Secretary-Treasurer, Dr. A. E. Berry, Ontario Department of Health, Parliament Buildings, Toronto, 5, Ont.

APRIL 10-11.—SPRINGFIELD, ILL.
American Water Works Association—Illinois Section. Annual convention. Secretary-Treasurer, A. E. Skinner, Care the Pitometer Co., 7311 Kenmore Avenue, Chicago, Ill.

APRIL 12-13.—HELENA, MONT. (75)
American Water Works Association—Montana Section. Annual meeting. Secretary, Herbert B. Foote, State Board of Health, Helena, Mont.

MAY 6-10.—CINCINNATI, OHIO.
American Water Works Association. Annual convention. (Hotel Netherland Plaza.) Secretary, Beekman C. Little, 29 West 39th Street, New York.

MAY 13, WEEK OF.—ATLANTA, GA.
National Fire Protection Association. Annual convention. (Atlanta Biltmore.) Managing Director, Franklin H. Wentworth, 60 Batterymarch Street, Boston, Mass.

MAY 16-18.—LEWISTON, IDAHO.
American Water Works Association—Pacific Northwest Section. Annual meeting. Secretary, Ernest C. Willard, 720 Corbett Building, Portland, Ore.

JUNE.—PRAGUE, CZECHOSLOVAKIA.
International Housing Association. Congress. General Secretary, Prof. Franz Schuster, Hansa-Allee 27, Frankfort a/M, Germany.

JUNE 17-21.—LOS ANGELES, CALIF.
Institute of Government. Sixth annual session. Executive Secretary, Walter E. Sykes, 3551 University Avenue, Los Angeles, Calif.

JUNE 24-29.—PARIS, FRANCE. (1,000)
International Chamber of Commerce. Biennial congress. Manager of the American Section, John P. Gregg, Connecticut Avenue and H Street N. W., Washington, D. C.

JULY, THIRD WEEK OF.—LONDON, ENGLAND.
International Federation for Housing and Town Planning. Congress. Organizing Secretary, H. Chapman, 25 Bedford Row, London, W. C. 1, England.

AUGUST 28-30.—PHILADELPHIA, PA.
National Shade Tree Conference. Annual convention. Secretary-Treasurer, Dr. R. P. White, New Jersey Agricultural Experiment Station, New Brunswick, N. J.

OCTOBER 14-17.—HOUSTON, TEXAS.
Southwest Water Works Association. Annual convention. Secretary-Treasurer, Lewis A. Quigley, Fort Worth, Texas.

OCTOBER 23-26.—SAN DIEGO, CALIF.
American Water Works Association—California Section. Annual convention. Secretary-Treasurer, J. E. Phillips, 207 South Broadway, Los Angeles, Calif.

GRIT . . . . BUT WILL IT STICK?

ORDINARY "dry-sanding" of icy roads on hills, curves and intersections often proves most inadequate to the protection of life, limb and property.

With temperatures remaining below freezing, untreated grit materials simply do not "take hold" as they should. . . . They themselves slide; are pushed aside by traffic. But Calcium Chloride treatment provides a thawing action—even in coldest weather—that enables sand or cinders to "dig in." Wheels stop . . . drivers and pedestrians are not so likely to overestimate the grit's effectiveness . . . the natural desire to obey traffic rules ends in fewer miscalculations. . . . A greater degree of safety is assured.

Also, it must be remembered that a frozen stock pile is as useless as a fan in Labrador. But pre-treated with Calcium Chloride, the materials remain loose, loadable, spreadable—instantly ready for emergencies. Calcium Chloride treated grit is a practical economy in its greater effectiveness.

WRITE for free literature and complete details about Calcium Chloride for better ice control. Address any of the members of this Association.

CALCIUM CHLORIDE ASSOCIATION

SOLVAY SALES CORPORATION . . 61 Broadway, New York City
THE DOW CHEMICAL COMPANY . . . . . Midland, Michigan
THE COLUMBIA ALKALI CORPORATION . . . . Barberton, Ohio
MICHIGAN ALKALI COMPANY . . 60 E. 42nd St., New York City

CALCIUM CHLORIDE

FOR BETTER ICE CONTROL

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

1934 Paving Brick Shipments Double 1933

According to reports received in December by the National Paving Brick Association, Washington, D. C., the total shipments of paving brick used in 1934 were expected to attain a total of 125,000,000, at least double the quantity used in brick pavements in 1933. O. W. Renkert, of Canton, Ohio, President of the Association, accounts for this 100 per cent increase over the previous year by citing several factors responsible for expanding the use of vitrified brick as a street and highway surfacing material. The construction of widened arteries of traffic in and through municipalities has been favorable to the heavy-duty type of pavement, such as brick. Relief to traffic is provided where there is the most congestion, and employment is afforded in populated districts where distress is the greatest.

"The use of brick for salvaging and resurfacing worn existing pavements," said Mr. Renkert, "has opened up an increasing market for paving brick, which has shown itself especially well adapted for this purpose. The Indiana and Michigan Highway Departments have this year awarded sizable contracts for brick resurfacing, following the successful experiences of Illinois, Ohio, and other states. The replacement, during the past season, of existing surfaces with brick on Chestnut and Walnut Streets in Philadelphia, Broad Street in Richmond, and on a large area of the pavements in the Loop district of Chicago, can be mentioned as examples of modern trends in municipal paving."

Making One Truck Do the Work of Two

Contractors' service trucks and the trucks of city engineering departments are called upon to handle many types of jobs. Some organizations mount full-size portable air compressors upon them for mobility, but this prevents the use of the trucks for other service. The Davey Compressor Co., Inc., Kent, Ohio, now offers a compressor of two-pavement-breaker or one-jackhammer capacity which can be mounted on any long wheelbase truck, taking its power from the truck motor. These truck-driven compressors occupy about one-fourth of the truck-body space, leaving room for special bodies to carry men, tools and materials. Because of their air-cooled construction, they absorb about one-fourth the weight capacity of a 1½-ton truck, leaving enough carrying capacity for other purposes.

National Paving Brick Assn.

The Association's annual meeting will be held at Indianapolis, Ind., February 6, 7 and 8, at the Claypool Hotel.

THE UNDER SIDE OF THE "LOCK LID," SHOWING THE WEDGE WASHERS CLAMPING IT TO THE FRAME

An Anti-Rattling Manhole Cover Developed in St. Louis

An anti-rattling manhole cover, designed to utilize as many old frames now in place as possible and to eliminate the continual wear caused by the movement of covers in the frames, has been developed by the Banner Iron Works, 4560 Shaw Avenue, St. Louis, Mo. This new "Lock Lid" cover has been developed after a lengthy study of manhole covers in St. Louis. It was found that traffic passing over a manhole in two directions wore almost a quarter of an inch from the seat of the frame in two years. Also, manhole covers which had been refaced by a machine built by the city of St. Louis and then placed on a previously refaced seat, began to rattle again after six or eight months of service. The rattling is due largely to the continually increasing volume and weight of traffic.

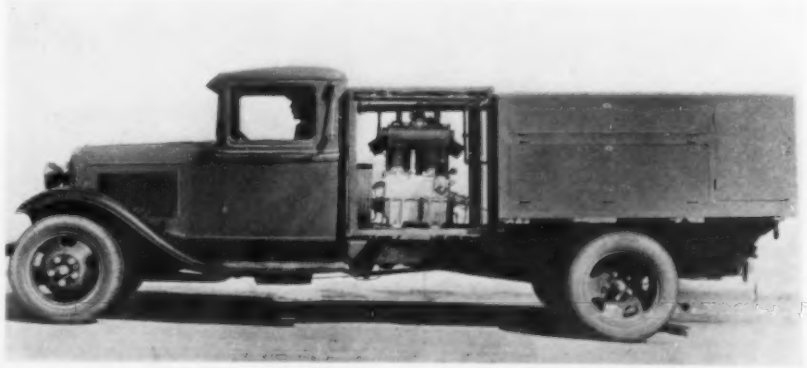
The method of preventing rattles with the "Lock Lid" cover is simple. Brackets cast integral with the bottom of the cover are placed so that they clear the frames when tipping the lid out. In addition, a wedge washer is used which has a cam on the bottom as well as on the top, and one side of which is cut away. The movement of the cam is caused by a pin which revolves in the cover and which also slides vertically through the various openings. The pin is square with rounded corners and an octagonal head with a lug cast at the bottom.

In placing a manhole cover, the pins are revolved in a counter-clockwise movement as far as they will go, to bring the flat side of the washer adjacent to the frame. The pins are then revolved in a clockwise movement with a wrench, until the desired tightness is obtained, after which the pins are dropped into an octagonal recess in the cover. In addition to the octagonal recess, there is another recess or hole long enough for the end of a pick or hook to raise the head of the locking bolt above the level of the cover. By turning the locking bolt in a counter-clockwise movement until it comes to a definite stop, the cover is in an opening position.

In designing this cover, the following points have been kept in mind: (1) minimum amount of work required to open and close lids; (2) all parts constructed so that a normal amount of corrosion will not affect the operation; (3) a unit adaptable to almost any type of frame now in use; (4) a cover that will give years of service at low initial cost.

New Vice-President Elected by Caterpillar

C. Parker Holt was named Executive Vice-President of the Caterpillar Tractor Co., Peoria, Ill., by the Board of Directors on December 7. At the same meeting Thomas J. Conner was made Vice-President in charge of manufacturing and was elected a Director of the Company to fill the vacancy on the Board of Directors caused by the recent death of Pliny E. Holt.



THE DAVEY COMPRESSOR MOUNTED ON A FORD TRUCK, SHOWING TRUCK BODY SPACE AVAILABLE

INTERNATIONAL

It takes a Truck Engine
TO STAND *the Gaff*

A PASSENGER car engine is called on to deliver from a *fourth* to a *half* of its full power most of the time. The average heavy-duty TRUCK engine delivers from *three-fourths* to *all* of its power practically all of its working time.

In terms of delivered energy the output of a TRUCK engine is perhaps *four times as great* per mile of travel. If the average car is disposed of at 50,000 miles, hundreds of hard-working trucks should be entitled to retirement in a few months' time. Nothing could be further from the minds of either the builder or the owner of the good truck. Thousands of International Trucks have traveled upwards of *two or three hundred thousand miles*, every mile a TRUCK mile.

The automobile tests many a fine quality in an engine, but the TRUCK tests *rugged strength* also! For more than twenty years the builders of International Trucks have built TRUCKS ONLY. Question any International owner as to the result.

INTERNATIONAL HARVESTER COMPANY OF AMERICA, INC.
606 South Michigan Avenue, Chicago, Illinois

Illustration shows the NEW 4- to 5-ton Model C-60. See the NEW Internationals at all International branches and dealers. Sizes, ½-ton to 10-ton. Chassis prices, $390 up, f. o. b. factory.

INTERNATIONAL TRUCKS

The Electric Operation of Important Water-Works Valves

In the control of valves in water pumping and distribution systems, filtration and sewage treatment and disposal plants, the importance of electrical operation cannot be emphasized too strongly. With hand operation of valves, the accessibility of the valves, and the time required to open or close them, are important factors which must be considered in providing for safe and efficient plant operation. With C-H valve control, produced by Cutler-Hammer, Inc., Milwaukee, Wis., each important valve, no matter where or how inaccessibly located, is individually controlled and can be opened or closed in a fraction of the time otherwise necessary, from a central control station, from pushbutton stations conveniently located, or automatically by variations in water level or pressure. On high-pressure water mains and in pumping plants, for example, not only does C-H valve control provide convenience and reliability of operation but its speed of operation is an important factor in providing maximum protection for property and life.

Cutler-Hammer valve operating units are available for valves of practically all types and sizes from 1 inch to 72 inches. A unit consists of a driving motor, reduction gears, limit switch mechanism, and an automatic declutching pawl device, all compactly mounted in a single totally enclosed splash-proof case. The unit is attached to a valve by four bolts or cap screws. When the motor is started from the central control panel or from one of the pushbutton stations, it attains full speed practically instantly. Immediately after the motor has attained full speed, the internal mechanism engages the motor with the valve stem through the reduction gearing, providing a positive unseating blow which will operate any valve at any time regardless of its rusty, frozen, or sticky condition. When the valve has been firmly seated or completely opened, the motor is automatically disengaged, so that its momentum is not transmitted to the valve stem after the valve has reached its limit of travel. Valves equipped with these units are always free for hand operation without disturbing the electric drive or control.

A "NEW DEAL" FOR THE STREETS OF LEAD, S. DAK.

The streets of Lead, which in the old days resounded to the shots of such famous plainsmen as Deadwood Dick and Wild Bill Hickok, now echo to the staccato exhaust of a modern diesel tractor as it pulls a large grader to put the city streets in tiptop condition for winter. The outfit consists of a Caterpillar diesel Thirty-Five and Thirty-Five grader recently purchased by the city authorities to handle municipal grading, dirt moving, hauling, road maintenance, and snow removal

More Rapid Settling of Coagulated Waters

A device for the more rapid separation of solids and liquids which is a radical departure from present methods of handling sedimentation problems in the water and industrial waste treatment fields, has been announced by the International Filter Co., Chicago, Ill. In addition to providing means for rapid and positive sludge removal, the Super-Settler design is based on the accurate control of the various flows and accelerated handling of the liquid. Maximum utilization of the tank volume is obtained by automatic control over every portion of the entire tank. The settling area can be increased to any capacity that is desired without changing the length of flow of the material.

The Super-Settler requires space approximately one-third the volume required by present-day settling basins equipped with sludge removal mechanisms. This is made possible by the positive control of the various factors which affect sedimentation, such as flow control of both sludge and liquid, shallow settling depths, rapid evacuation of the material after separation has taken place, velocity of ow, and short circuiting.

This equipment is designed to handle any sedimentation problem in the water or industrial waste treatment field, either separate or in combination with the Supermix. Concrete tanks with interior construction of either precast concrete, steel or transite is usual construction, but the simple structure allows the use of any suitable material whether located above or below ground level. The sludge collecting and moving mechanism is extremely simple.

Courtesy of International Nickel Co.

A MONEL METAL SCREEN IN THE NEW YORK CITY SEWAGE PLANT AT JAMAICA, L. I.

The monel metal strip has been in service seven years exposed to the corrosive action of the sewage, and to abrasion by sticks and hard foreign particles of various descriptions. It shows little effect of this difficult service

Copper and Brass Research Association Reorganizes

At a reorganization meeting of the Copper and Brass Research Association, 25 Broadway, New York, the mining companies withdrew from the organization, and the fabricating members formulated plans for a promotional campaign for the coming year.

The following officers were elected: President, F. S. Chase, President, Chase Brass & Copper Co.; Vice-Presidents—John A. Coe, President, American Brass Co.; C. D. Dallas, President, Revere Copper and Brass, Inc.; Wylie Brown, President, Phelps Dodge Copper Products Corp.; Treasurer, C. T. Ulrich, Vice-President and Treasurer, Kennecott Copper Corp.; Secretary, B. B. Caddle.

Those elected to the Board of Directors are: F. S. Chase and R. L. Coe, Chase Brass & Copper Co.; C. D. Dallas and J. A. Doucett, Revere Copper and Brass, Inc.; John A. Coe and John A. Coe, Jr., The American Brass Co.; E. O. Goss and W. M. Goss, Scovill Manufacturing Co.; R. E. Day and Herman W. Steinkraus, Bridgeport Brass Co.; Wylie Brown and H. A. Staples, Phelps Dodge Copper Products Corp.; C. C. Limbocker, Wolverine Tube Co.; C. T. Ulrich, Kennecott Copper Corp.; and B. B. Caddle, Secretary of the Association.

IN 1935: BRICK PAVEMENTS WILL *AGAIN* SHOW LOWEST YEARLY COSTS!

Cedar Glen Road, near Cleveland, Ohio

● As the new year starts, there is one fact that road-builders and road-users may be sure of—the low future cost of brick.

Low maintenance has always been the rule with brick pavements. It will prove even more true of pavements yet to be built.

For brick pavements as now built with better engineering knowledge and construction methods and better subgrade conditions will give far more value than the splendid brick veterans now in service after 40 years of use.

In these veteran pavements which have established an all-time record for low upkeep costs, the salvage value of the brick often runs 90% or more.

The reason for the low cost of brick pavements is evident. A brick surface has far greater immunity to weather damage than any other commonly used paving material. It is denser —less absorbent. It is not opened by expansion and contraction; it does not soften under intense heat. Age does not change or weaken its structure. And as for traffic wear, nothing on wheels can damage it.

Plan now that pavements to be built in 1935 will be economical. You can make them so if you build of brick on both new construction and resurfacing jobs.

For further information write, National Paving Brick Association, (Affiliated with Structural Clay Products, Inc.) 1245 National Press Building, Washington, D. C.

Annual Meeting National Paving Brick Association, Feb. 7-8, Hotel Claypool, Indianapolis. Papers and discussions by leading Engineers.

BRICK

Exhibitor, Highway Exhibit, American Road Builders' Association, January 22-25, Washington, D. C.

Protects Against Weather as well as Traffic

A WESTERN NO. 5 PLANER DRAWN BY A MODEL 35 CLETRAC TRACTOR
Note the appearance of the road ahead as compared to that in the foreground over which the planer has passed

One-Man Maintainer Works Behind Tractor

A one-man maintenance unit for use behind any tractor from 20-hp up and consisting of a series of cutting blades that distribute the loosened material over the road surface, effectively filling all ruts and depressions, has been announced by the Austin-Western Road Machinery Co., Aurora, Ill. This Western No. 5 planer is controlled by the operator of the tractor by means of a hand wheel within easy reach and adjustable both as to height and distance from the tractor seat.

The planer has an actual cutting width of 12 feet and carries 46 feet of cutting blades. There are three stationary blades on each side running to the middle of the frame, and one long adjustable blade, at the rear, that can be set to any desired angle. For use in cases where there is plenty of loose material at one side of the road and a scarcity of available material in the middle, an auxiliary blade is furnished. This blade connects one of the forward sets of blades according to the direction the material is to be moved, and the material is carried across the machine to where it is needed. The remaining blades work back and forth as before.

The drag frame is made of heavy 6-inch ship channels thoroughly braced by means of two heavy torque tubes, 5 inches in diameter. The main frame similarly is braced by two torque tubes 3½ inches in diameter, which prevent the frame from weaving when the machine is operated. The machine is furnished with an Alemite high-pressure greasing system except for the gears, which run in oil.

Assistance for Swimming Pool Operators

The Everson Filter Co., 627 West Lake Street, Chicago, Ill., in its service folder, "Plunge in Purity with Safety," has presented for the benefit of pool owners and operators a wealth of material on the best ways to maintain their pools in conformity with the highest standards of cleanliness, sanitation and attractiveness.

The bulletin discusses the application of chlorine as a swimming pool disinfectant through the use of powders, or of chlorine gas applied from cylinders, or of chlorine manufactured direct from common salt. The methods of making tests for residual chlorine in swimming pool water are described, and first aid instructions for those exposed to chlorine gas are given in detail. There is also a discussion of the sterilizing of water by the use of the ultra-violet ray and by the use of ozone, with suggestions for the most effective use of these processes.

There is advice to operators of "fill-and-draw" pools, followed by a discussion of the advantages of recirculation and the filtration of swimming pool water, the care of filters and the use of alum in the filtration of swimming pool water. The need of keeping up the alkalinity of the water because of its increasing acidity through use is discussed in detail, and then attention is called to various swimming pool accessories, such as the vacuum cleaner for removing sediment from the bottom of the pool, the hair and lint catcher, springboards, slides, and submarine lights for swimming pools; and details are discussed in full so that the operator has a thorough knowledge of his duties and the materials and equipment which are available to make the swimming pool safe, sanitary and attractive.

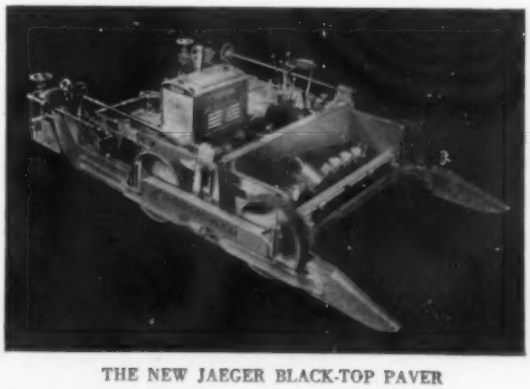
New Black-Top Paver Is Self-Propelling

Claiming that the new 1935 model black-top road builder will lay bituminous pavements with a smooth, fine riding surface without the use of road forms, the Jaeger Machine Co., 505 Dublin Avenue, Columbus, Ohio, announces that the machine will handle 400 to 1,000 tons of material per day, and is adjustable for widths from 9 to 15 feet. Material is received in a hopper from a dump-truck which the paver pushes forward at the speed with which the spreader screw distributes the material on the prepared grade of the highway.

Instead of side forms, the machine uses the 18-foot-long straight-edge runners which are full floating and carry the screed only. All other weight of the machine and road material is carried on four rubber-tired wheels. None of the weight of the machine is placed on the new road surface, for the runners and wheels operate on the old road or subgrade, and only the screed and blender screeds at the rear touch the newly laid material. The four rubber-tired wheels, operating on firm ground, will take the machine with a loaded hopper up any grade with no spinning of the wheels or tearing of the surface. The runners can be lifted in two seconds, by power, for maneuvering the machine to a new location laterally or at some distance along the road.

The screed has a saw-tooth front edge, which oscillates, is tilted for compaction and can be set for any specified crown and thickness of spread from 1 inch to 6 inches, and runs to any grade wire or marker. The screed can be run with one end below the runners and the other end 7 inches above the runners. The telescopic frame permits adjustments from 9 feet to 15 feet by addition of change parts. The blender screeds, at the rear of both runners, adjusts laterally for spreading bled back material to any additional widths up to 12 inches on either side, which is 6 inches outside the runner. The ability to lay 15-foot strips makes it possible to spread a 30-foot road in two trips, thus effecting a considerable saving in paving the through roads.

A power-driven screw and heater help to break up lumps in the material. The reversible screw, which spreads laterally, allows the operator to spread material where desired. The machine is of automotive construction throughout, with a 32-hp engine, has heat-treated gears running in oil, built-in differential for easy steering, banked controls and variable speeds forward of 12 to 25 feet per minute and up to 120 feet per minute in reverse.

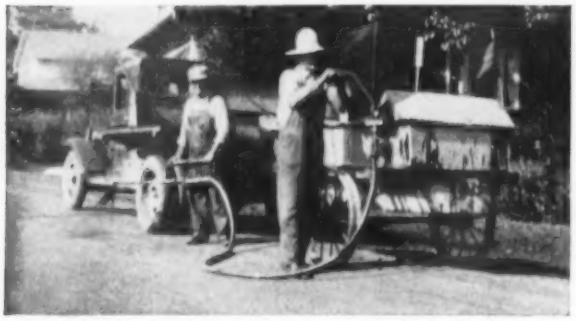


THE NEW JAEGER BLACK-TOP PAVER

Littleford Model "C" Pressure Distributor in service of the Richland County Highway Department. Shown applying a surface coat to secondary highway at Mansfield, Ohio

Use Littleford Equipment

for Low-Cost Maintenance



No better combination exists than the Littleford No. 84 HD Maintenance Kettle and Hand Spray Attachment for efficient skin and penetration patch work. Kettle sizes: 75, 110, 165, and 210 gallons

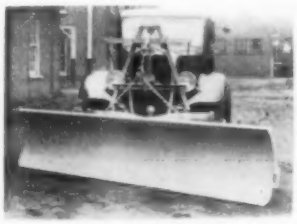
When it comes to equipment for surface coating and penetration patch work, it will pay you to consider our very complete line. With a Littleford Catalog before you, you can easily select the right outfit for the work you have to do. There are Pressure Distributors ranging in size from 300 to 1500 gallons that handle all types of bituminous material; Tar and Asphalt Kettles; Emulsion Sprayers, Surface Heaters and many other outfits—all designed and constructed for a definite purpose.

It costs you nothing to get complete information about Littleford Equipment. Start the New Year right—send for our complete catalog, look it over and select the equipment you need.

LITTLEFORD BROS.
500 E. Pearl St. Cincinnati, Ohio

D A N G E R !

Snow and glare ice —the "killers"— have arrived!



Good Roads

Take no chances — safeguard your streets with

GOOD ROADS

CHAMPION SNOW PLOWS
Catalog No. 53

SAND and CINDER SPREADERS
Bulletin No. 50

Products of

GOOD ROADS MACHINERY CORPORATION
Kennett Square, Pa.

Complete assortment of general line of nursery products. Also large specimens of shade and ornamental trees and shrubs.

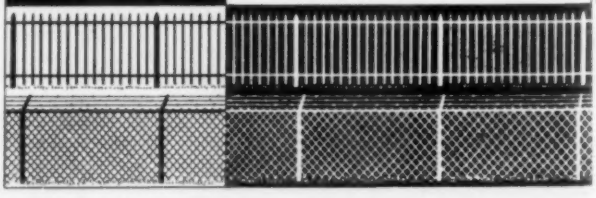
BIG TREES MOVED AND GUARANTEED

Consultations and Inquiries Invited

THE GREENING NURSERY CO.
MONROE - - - MICHIGAN
Born 1850 - - - - Still Growing

FENCE *for every* PUBLIC PROPERTY *need*

Stewart FENCES
IRON AND CHAINLINK WIRE
New Catalog sent upon request.
The Stewart Iron Works Company, Inc.
211 Stewart Block Cincinnati, Ohio

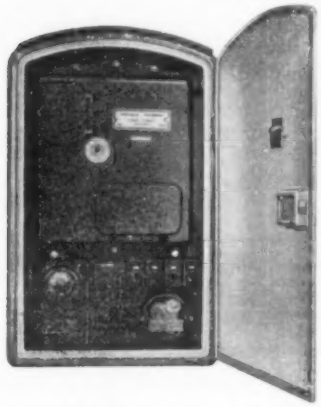


During January we hope you will remember to mention THE AMERICAN CITY

Greater Flexibility in Traffic Control

A flexible progressive traffic control system permits vehicles moving in time with signal lights to pass one intersection after another along a thoroughfare without stopping. It allows traffic to flow with minimum confusion and at the highest average speed consistent with safety. The time of each complete cycle of operation of the signals at any intersection should be adjustable from a central master controller. A cycle time anywhere between 30 and 100 seconds is found useful in the average system. Either the Eagle Co-ordiplex or the Eagle-Senior controller may be applied in a flexible progressive system.

Eagle-Senior controllers, produced by the Eagle Signal Corporation, Moline, Ill., provide great flexibility. They may be purchased in their simplest form, and as conditions demand other features,



CONTROLLER FOR THE EAGLE-SENIOR TRAFFIC SYSTEM

such as hand control, remote shut-down, emergency signals, flashing lights, special cycles, etc., these features can be added at nominal expense.

These controllers may be utilized at isolated intersections with no regard for coordination with other controllers. They may be equipped with synchronous cycle units, in which event they will remain coordinated with other controllers driven by synchronous motors. If these controllers are equipped with synchronous cycle units, they may later be used in a flexible progressive system by discarding the synchronous cycle unit and adding an induction cycle unit which may be supervised by an Eagle master controller which has control over a flexible progressive system.

These controllers employ two induction disc motors for driving power. One is known as a "cycle motor," and when the controller is used in a flexible progressive system, it is synchronized with the master timer and the corresponding motor in all other local controllers. When the controller is used at an isolated intersection, the cycle motor is connected directly to the local power supply, and the speed at which it rotates determines the time of each cycle of operation of the signals. The second motor rotates during a normal cycle only when the signal lights are changing. This motor is known as the "contact unit motor."

Trip keys projecting from the periphery of the dial driven by the cycle motor operate a switch which, at the proper time, causes the contact unit motor to drive the cam assembly, thereby causing the signal colors to change. In changing cycle lengths from the master timer, no gears are shifted in the Eagle-Senior controller, the speed of the cycle motor being altered entirely by an automatic change in the position of the shading pole of the cycle motor. Even though the cycle unit of the Eagle-Senior controller is of the induction type, it acquires synchronous characteristics when employed in a flebixle progressive system controlled by an Eagle synchronous master controller and accurate timing results.

The Eagle-Senior controller provides wide limits of adjustment. Any period within the cycle may be set at a minimum of 2 per cent of the cycle and to a maximum of any desired amount. The percentage of the cycle occupied by each color period is clearly indicated on the dial. The mechanism of the Eagle-Senior controller is supported on hinged members so that it may be withdrawn from its cabinet while operating and may be inspected and adjusted without removing the controller from service. The mechanism is likewise spring-connected within its cabinet, so the controller may be taken out of service in a matter of a few seconds without disconnecting any wires.

Clean Surface for Brick Pavements Now Possible

Road builders have frequently complained of the objectionable appearance of brick pavements after the surface has been smeared with asphalt in squeegeeing the joint material between the bricks. A new technique now enables contractors and highway officials to produce brick pavements with a perfectly clean surface and tight asphalt joints. After the brick has been laid, Solvay calcium chloride, marketed by the Solvay Sales Corporation, 61 Broadway, New York, is distributed over the surface in the form of a fine mist or spray by means of a simple hand sprayer. When properly sprayed vertically downward and not so as to strike the sides and edges of the brick, the calcium chloride covers the top surface completely but does not penetrate between the bricks. The asphalt is then poured on the brick while the calcium chloride is still wet, and all joints are filled to the top.

As soon as the asphalt is dry, it is peeled or rolled off in sheets, leaving a clean surface brick with flush well-filled joints. The excess asphalt can be reheated and used again, leaving practically no sediment to be cleaned out of the kettle and causing no foaming or bubbling.

According to George F. Schlesinger, Managing Director, National Paving Brick Association, a 35 per cent solution of calcium chloride with a 1 per cent starch content furnishes the best results.

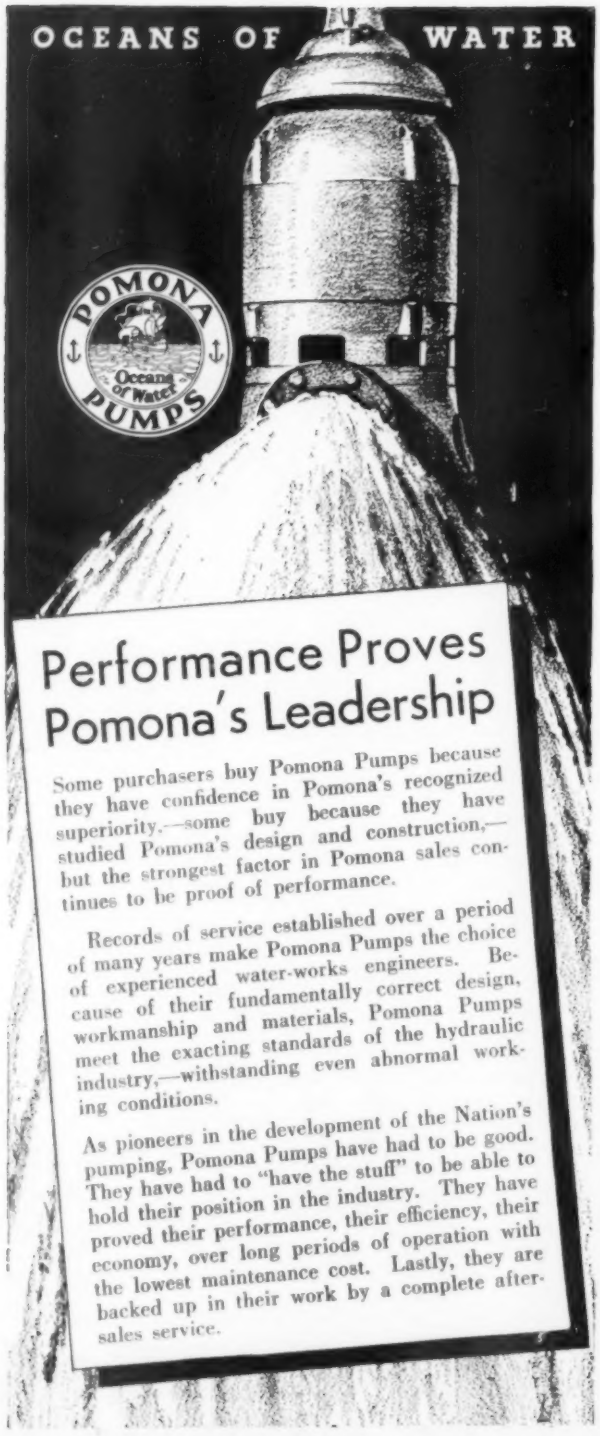
Jenkins Announces New Valves

Jenkins Bros., 80 White Street, New York, has announced several additions to its line of bronze gate-valves, which include inside screw, traveling spindle patterns with screwed and flanged ends for various working pressures, and a line of extra-heavy bronze regrind-renew valves which are made in globe and angle patterns.

The new gate-valves fully conform to the Jenkins standards and have many new features which assure long service. Among them are: all bonnet threads which are in contact with the spindle at all times whether open, closed or intermediate; the body is cast of Jenkins electric furnace bronze, is liberally proportioned and has free passages; the guides cast in the body keep the wedge in line for true seating and when the valve is fully open, the wedge is entirely out of the line of the flow.

The new line of extra-heavy bronze regrind-renew valves are fitted with nickel-alloy seat rings and discs and with nickel-alloy seat rings and plugs. These valves are of the union bonnet type in sizes to 2 inches. In the 2½- and 3-inch sizes, the valves are made with a bolted bonnet. In all these new valves, the diameter of the disc or plug is scientifically correct in relation to the seat, which permits the valves to be reground repeatedly without danger of scoring or grooving the disc. Stuffing-boxes are deep and contain a liberal bulk of lubricated and graphited asbestos packing. The use of a bronze gland or follower compresses the packing, permitting tightness with but slight effort applied to the packing nut. This reduces the friction around the spindle and provides for ease of operation. The spindles, of manganese bronze, are accurately machined and provided with Acme threads.

SPRAYING THE BRICK WITH SOLVAY CALCIUM CHLORIDE TO PREVENT ADHESION OF THE ASPHALT TO THE TOP SURFACE



Performance Proves Pomona's Leadership

Some purchasers buy Pomona Pumps because they have confidence in Pomona's recognized superiority,—some buy because they have studied Pomona's design and construction,—but the strongest factor in Pomona sales continues to be proof of performance.

Records of service established over a period of many years make Pomona Pumps the choice of experienced water-works engineers. Because of their fundamentally correct design, workmanship and materials, Pomona Pumps meet the exacting standards of the hydraulic industry,—withstanding even abnormal working conditions.

As pioneers in the development of the Nation's pumping, Pomona Pumps have had to be good. They have had to "have the stuff" to be able to hold their position in the industry. They have proved their performance, their efficiency, their economy, over long periods of operation with the lowest maintenance cost. Lastly, they are backed up in their work by a complete after-sales service.

POMONA PUMP CO.

53 W. Jackson Blvd. Chicago, Ill.

206 E. Commercial St. Pomona, Calif.

POMONA
TURBINE PUMPS

IN AMERICAN WATER METERS

you obtain these needed features not found elsewhere. They insure maximum return on your meter investment:

Extra-thick reinforced measuring disc minimizes slippage, compels extra accuracy that wins comparative tests.

Frost bottom tested at the factory to break at the proper pressure—500 to 550 pounds. No dependence on flange bolts.

Frost-protected gear train, with gears that separate upon freezing as well as the chamber.

Chromium-shell gears with enclosed dirt-proof bearings wear almost forever and are adequately lubricated by water. Oil-enclosed gears, optional.

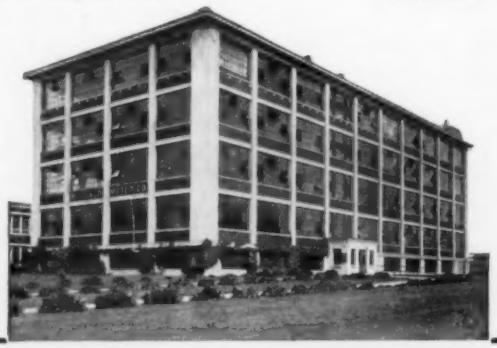
Simplicity that requires only the absolute minimum of parts and keeps each part simple.

Precision manufacture so fine that all parts are completely interchangeable and are regularly sold singly,—no matched pairs or unit assemblies needed.

Standard stock meters containing the construction described above will be supplied on request for inspection or testing purposes. Our catalog also gives full description.

BUFFALO METER COMPANY

2902 Main Street Buffalo, N. Y.



ONE OF THE NEW INDUSTRIAL TRACTORS PULLING IDEAL GANG MOWERS

A New All-Purpose Industrial Tractor

A new all-purpose industrial tractor, in three models, is announced by Clark Tructractor Co., Battle Creek, Mich. This Clarktor-6 has a 46-hp, 6-cylinder power plant and its designers claim a pound of drawbar pull for every pound of tractor weight. Heavy-duty Clark transmission and special gear ratio in a double reduction rear axle makes a wide range of speeds available to handle various types of service with speeds as high as 18 mph. This is of special importance in maintenance work in connection with country clubs, parks and boulevards where speed of operation has an important bearing on the tractor's earning capacity.

All models have self-starter, generator, battery, electric horn, front bumper plate, eye coupler, and pneumatic tires. Lights are available on all models, to facilitate night operation. Three models comprise the line: Light—for general industrial use; Speed—especially suitable for country club, park and boulevard service; and Heavy—for the tougher towing assignments, such as steep grades for trailer trains and shifting freight cars on warehouse sidings.

Armored Bodies for Police Cars Offer Various Degrees of Protection

Armored bodies made by Federal Laboratories, Inc., 185 41st Street, Pittsburgh, Pa., show no outward signs of armor and are built in five separate classifications: (1) armored throughout against revolver and pistol fire; (2) armored throughout against revolver and pistol fire, with front, including radiator, windshield and cowl armored against rifle fire; (3) armored throughout against rifle fire, except for glass, which is armored against revolver and pistol fire; (4) partially armored, front armored against all revolver and pistol fire; (5) partially armored against rifle fire. The windshields may be reinforced by a special removable armored shield, to give protection against rifle fire in classifications (2) and (3).

The windshield section involves a special frame designed to carry 1⅛-inch thick Underwriters' approved glass of the latest type which will resist revolver and pistol fire, including the new super-type bullets with a muzzle velocity of 1,300 feet per second. A specially designed gunport can be installed on either or both sides, sufficiently large to permit the installation of a submachine gun, rifle, shotgun, or small firearms. A slight turn of the special lever opens the gunport for instant action.

When cars are built for riot and patrol service, the seating arrangement provides space for 10 men and a full complement of fighting equipment. Gun racks and ammunition cases are built underneath the seats, and are designed to hold the equipment securely, preventing rattle or damage, and yet they are quickly accessible in an emergency. Portable cylinders can be mounted underneath the truck body. These cylinders may be charged with different type gases, and operated by control valves inside the truck body. Trucks so equipped and driven alongside or through unruly mobs, can disperse them quickly, by release of gas from cylinders. An effective smoke screen can also be ejected behind which police movements may be screened.

Federal armored riot and patrol cars should be equipped with: 2 Thompson submachine guns, 4 Federal gas riot guns, 24 long-range projectiles, 24 short-range cartridges, 48 Federal Jumbo grenades, 10 type GB gas masks, 1 siren, 1 radio, 1 spotlight and 2 portable chemical cylinders.

Pickett New Advertising Manager of Toncan Culvert Association

The Toncan Culvert Manufacturers' Association, Youngstown, Ohio, has announced the appointment of H. N. Pickett as Advertising Manager. Mr. Pickett has been Advertising Manager of *Daily Metal Trade* for a number of years and his direct association with industrial advertising and publishing covers a period of more than twenty years.

Caterpillar Announces a Diesel Forty Tractor

The diesel Forty tractor, recently announced by Caterpillar Tractor Co., Peoria, Ill., brings greater power, increased strength and the outstanding operating economy of the diesel engine to a long list of tractor jobs. Its 3-cylinder diesel engine develops 44-horsepower at the drawbar and 49-horsepower on the belt. The power of the engine is balanced by the strength of the machine itself, according to the manufacturer. The track assembly and track frame features the same rugged construction found in the largest Caterpillar models, including cast steel diagonal braces, enclosed recoil springs, double front idlers and heavier track links of improved design.

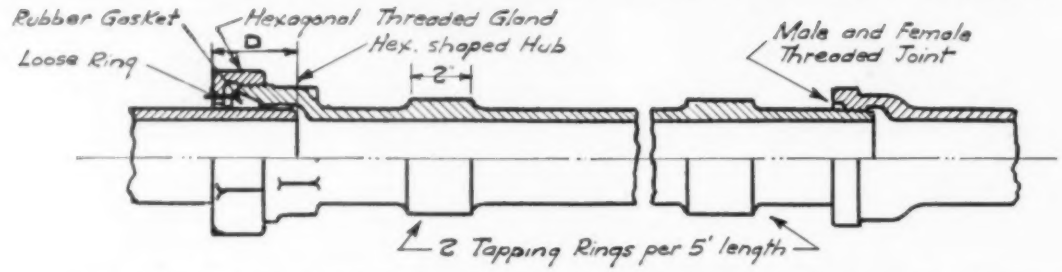
This combination of increased power and strength means ability to handle bigger loads in all four working speeds. The diesel Forty is built to pull a 6-8-yard wagon or a 7-8 bottom plow under most conditions. The frame is drilled for mounting such equipment as bulldozers, trailbuilders, hoists and side booms. Wide-gage models and a wide variety of track equipment are available. The shipping weight is 14,708 pounds.

New Manager for Culvert Co.

Paul W. Gregory has recently been appointed General Manager of the Canton Culvert Co., Canton, Ohio, subsidiary of the Republic Steel Corporation, according to an announcement by N. J. Clarke, Vice-President in charge of sales of the parent organization.

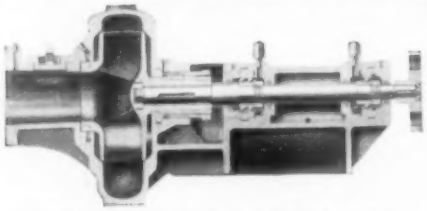
FEDERAL ARMORED POLICE CRUISER ON FORD CHASSIS, SHOWING GUN CASE WITH SOME AUXILIARY AMMUNITION

2" CAST IRON PIPE WITH MECHANICAL JOINTS



Size, 2 in.; O. D. (same as steel) 2.375 in.; weight per foot including joint, 6 lbs. Combines the well-known longevity of cast iron pipe with the construction advantages of a widely deflectable (8 degrees) yet bottle-tight joint. Known as "Monoloy MJ Piping." For literature write American Cast Iron Pipe Co., Birmingham, Alabama.

Clear Water Efficiency
from a CLOGLESS PUMP



Section of Clogless Pump with enclosed impeller

THE DE LAVAL CLOGLESS PUMP, used for screened and unscreened sewage, paper pulp and other liquids carrying large quantities of suspended solids, runs at slow speed and has carefully proportioned impeller passages, comparing favorably in efficiency with standard high speed clear water pumps.

This high efficiency can be maintained indefinitely, as means for sealing with clear water prevents abrasive matter from entering between the wearing rings or into the stuffing box; furthermore, these wearing rings can readily be renewed, both for casing and impeller.

The interiors of De Laval Clogless Pumps are easily accessible. The De Laval Clogless Pump is designed for either horizontal or vertical mounting.

DE LAVAL STEAM TURBINE COMPANY
Trenton, New Jersey

3156

A Good Name Since 1869

Good products, good service and fair business tactics built a good name—HAYS. Since 1869 we have striven in every effort to make people like to do business with Hays.

The name Hays impressed on a product is your assurance that highest quality standards have been adhered to—it is our mark of responsibility for the good performance of that product thru the years. Send for Hays catalogues describing all good Hays Water Works Products.

Hays Mfg. Co. 826 W. 12 St., Erie, Pa.

Copper Service Fittings
Copper Service Tools
Water Works Brass Goods
Tapping Machines
Iron Products

A Good Concern to do Business With

DEPENDABLE ALWAYS

For strong, tight, flexible cast iron water pipe joints * * * Used on thousands of miles of pipe for more than 21 years * * * Not a failure anywhere.

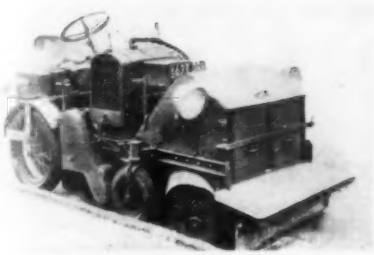
HYDRAULIC DEVELOPMENT CORPORATION

Main Sales Office: 50 Church Street, New York, N. Y.
General Offices and Works: W. Medford Sta., Boston, Mass.

HYDRO-TITE

A DEPENDABLE SELF - CAULKING JOINT COMPOUND

HYDRO-TITE



THE NEW "CIVIC PRIDE" MOTOR PICK-UP SWEEPER

A New Power Street-Sweeping Machine

A compact, easily controlled street-sweeping machine, designed to do the job at a minimum of expense, is being manufactured by the Coldwell Lawn Mower Co., Newburgh, N. Y. The machine turns in a 12-foot space and works best at six miles per hour, although it can attain a speed of 25 miles per hour when moving from one location to another.

The machine cleans a swath 4½ feet in width from the curbing along the street, for it is in this area that the bulk of dirt lodges, owing to the fanning action of automobile traffic. The dirt is picked up by a curb broom and an elevator, which lifts it into cans which are conveniently placed on the machine. As the cans are filled, they can be taken from the machine and emptied into an auxiliary can standing along the street; or by a system of relay cans, the filled cans may be replaced with empty ones. In either case, the final disposal coincides with the present system of garbage and ash collection.

By this system no time is lost in sending the sweeper to the dump, and there is no extra handling of the dirt. The first cost of the machine is reported to be about one-fourth the price of large sweepers, and the up-keep to be about one-eighth of present costs. Full information and photographs will be furnished on request, by W. J. Knaut, 68 Pendleton St., New Haven, Conn., Special Representative of the Coldwell Lawn Mower Co.

A Combination Pipe Puller and Pusher

A new machine weighing only 60 pounds has been built by Frazier & Scott, Troy, Ohio, to install underground water services. This Trojan combination pipe puller and pusher has two separate gripping devices which automatically grip and release the pipe. One moves forward gripped to the pipe as the other is moving back to a new hold, giving a continuous movement of the pipe regardless of the direction the handle is moved. The machine can be successfully operated using only one jaw at a time or both together. One setting of the jaws will pull any length of pipe without changing, since the pipe will travel continuously as long as the handle is operated.

As a pusher the machine will force new pipe underground in a straight line, making possible the installation of a new service without digging the entire trench. Only a short space is needed to operate the machine. If copper or lead pipe is used, the machine may be used as a pusher first for a pipe or push rod, and then by using the machine as a puller the new line can be pulled in behind the push rod.

The machine is so designed that one man with a 5- or 6-foot lever can readily operate the machine at an approximate rate of 2 feet of pipe per minute. The machine is only 10 inches high and has a pipe stroke of 2¾ inches. It is 11 inches wide and 24 inches long.

A Vibratory Chemical Dry Feed Machine

A vibratory dry feed machine consisting of a vibrating trough feeder, a vibrated hopper, a rheostat controlling the volume of flow of the feeder with an indicator, and a control box for the two vibrating elements, has been announced by Syntron Co., 400 North Lexington Ave., Pittsburgh, Pa. This machine has a capacity from 2 ounces to 2,000 pounds per hour, making it readily adaptable to the very wide range of water-works needs.

THE SYNTRON VIBRATORY DRY FEEDER

The vibrating feeder causes the dry material to flow forward out over the end of the trough solely by vibration. A steady discharge from the hopper into the feeder is provided by the small vibrator mounted on the side of the hopper, which keeps the contents agitated. The volume of flow through the feeder is regulated by the rheostat controlling the power input to the feeder vibrator. The discharge opening of the hopper into the feeder is made larger by tilting the bottom of the hopper forward over the shelf in the feeder trough. Very slow, fine feeds can be secured by removing the rear spring support of the feeder. The machine is not noisy in operation—merely a low hum from the vibrator.

The machine is used for feeding lime, soda, carbon, etc., in treating water, and the flow stops instantly with the throw of the switch, there being no momentum to stop. There are no motors, gears, slide valves or wearing parts. The vibrators are simple electro-magnets with all the movements through flat leaf springs and live rubber.

An All-Service Gas Mask for Fire Departments

A majority of the Fire Departments of the United States, and mines, steel and chemical plants, gas and power companies, are equipped with Burrell all-service gas masks, made by the Mine Safety Appliances Co., Braddock, Thomas and Meade Streets, Pittsburgh, Pa. The Burrell all-service mask can be put on and adjusted quickly, fits any face comfortably without drawing or binding, and permits easy and natural breathing, hearing, sight, and working freedom for the wearer.

The speaking diaphragm, an exclusive MSA development, is of micarta and transmits speech naturally and without distortion, assuring communication between men in gas- or smoke-filled air. It permits clear speech over a telephone or through speaking tubes. The lenses in the headpiece are of shatter-proof safety triplex glass, protecting the wearer both from eye injury and from the entrance of gas through broken lenses. The harness is of khaki webbing, readily adjustable to any required size. The corrugated tube from the canister to the mask is flexible to permit free head movement, is non-porous and is made of materials to withstand acid fumes and water, and is resistant to oil. The canister is provided with chemicals for absorbing or rendering harmless all poisonous gases, smoke and fumes met with in industry. The automatic timer is a simple and positive device which records the service undergone by the canister and shows when a new one must be used, thereby eliminating all guesswork.

THE BURRELL ALL-SERVICE GAS MASK, WITH EXTRA CANISTER IN ITS CARRYING CASE

MUD-JACK METHOD

Corrects Sunken Street Slab—

as well as curb, gutter and walks. The No. 10 N. E. C. Mud-Jack raises sunken curb and gutter to the original or proper grade — and then raises the street slab to obtain a level surface. No replacement cost necessary—no street obstruction common to reconstruction activities—and above all, maintenance costs are reduced to a minimum.

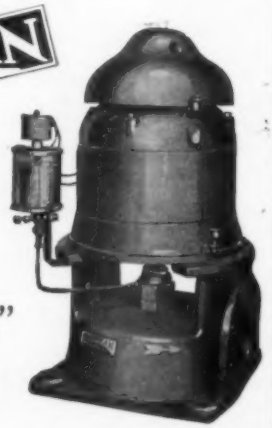
Write for Mud-Jack Bulletin A. C.

KOEHRING COMPANY

Milwaukee Wisconsin

For Raising Concrete Curb, Gutter, Walks, Street

AMERICAN
AURORA, ILL.



NEW "AMERICAN" TURBINES

The new "American" Turbines have all the features that have made them standard equipment in municipal pumping stations for many years—efficiencies that materially reduce the present cost of pumping water. These new turbines are designed for wells as small as 6 in. in diameter, and are equipped for either oil or water lubrication. "American" engineers and sales offices will gladly furnish data to municipal engineers or officials on this new, low pumping cost turbine.

THE AMERICAN WELL WORKS

General Offices and Factory
AURORA, ILLINOIS
Branch Offices
CHICAGO NEW YORK
Agencies in all principal cities

McWANE CAST IRON PIPE CO. BIRMINGHAM ALABAMA

PACIFIC STATES CAST IRON PIPE CO. PROVO, UTAH

Manufacturers of

Bell and Spigot type CAST IRON PIPE
with or without Precaulked Joints
Long lengths. Sand Cast. 1¼ through 12 inches.

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LOS ANGELES 6800 S. Alameda Street	PORTLAND, ORE. 606 Spalding Building	SALT LAKE CITY 149 W. 2nd South St.

SIMPLEX VENTURI TYPE METERS

ACCURATE - RELIABLE - SIMPLE
EASY TO CHECK AND ADJUST

Write for Bulletins

SIMPLEX VALVE & METER CO.
6743 Upland Street, Philadelphia, Pa.

Manufacturers of Meters and Controllers of Venturi Type; Gauges; Air and Vacuum Valves; Air Release Valves; and other Water-Works Devices.

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Planned Street and Highway Lighting Through State Codes

By **ARTHUR F. LOEWE**
Advisory Council Committee on Street and Highway Lighting and Safety, New Jersey State League of Municipalities

A prominent lighting expert stated recently that most municipal officials believe that illumination is a mysterious problem and that local conditions are so different that they do not lend themselves readily to solution. To a certain extent this belief is justified, and that is why the New Jersey State League of Municipalities appointed a committee on Street and Highway Lighting and Safety, to devise a lighting code which, based on that of the Illuminating Engineering Society, would fit conditions in New Jersey. Mr. Loewe here calls on other states to provide their municipalities with a street and highway illumination yardstick.

STREET lighting in many states, with few exceptions, has not kept pace with either modern roads or modern traffic. Investigations of the relation between street safety and street lighting have pointed clearly to the conclusion that the people in every community pay for the protective qualities of street lightiny whether they have that street lighting or not.

The New Jersey State League of Municipalities appointed a committee on Street and Highway Lighting and Safety to determine the amount of light necessary to provide adequate visibility on the streets and highways at night, and how it can most effectively and economically be applied and maintained. Information was gathered from all sources and applied as best fitted to conditions in New Jersey.

The basis of the engineering specifications was the Illuminating Engineering Society's Code on Street and Highway Lighting. This Code specifies minimums as they might apply generally throughout the country, but the New Jersey Committee felt that a general instead of a minimum picture of the situation should be given. This necessitated, then, a discussion of (1) the value of street lighting, (2) its status, (3) the adoption of a program, (4) the classification of streets, and (5) actual lighting recommendations.

Undoubtedly the greatest value that the municipalities in New Jersey will receive from this lighting recommendation is a recognition of the ease with which night safety can be assured to the municipality. Whereas the I.E.S. Code quite naturally stresses the engineering features and quantities of light necessary, the state recommendations are technical and written to known local conditions. Governor Harold G. Hoffman has said: "Give us better and more light at night and we can substantially reduce the total of motor crashes. The State Department has found that where adequate lighting is provided, it has been followed by a substantial reduction in night collisions." The average municipal official knows this statement is true, but must plan in the face of budget curtailment demanded by taxpayers who know little about the ultimate costs of a quality of highway lighting that promotes crashes, and of street lighting that proclaims the town unprogressive and defeatist.

Adopt a Street-Lighting Program

To cope with this situation, the Committee on Street and Highway Lighting and Safety urges that a progressive plan of street lighting be adopted by ordinance. "A street lighting system should be developed and operated with due regard for practical economy and appearance, so that the public will receive the utmost in lighting effectiveness for funds available."

The system should be built up from a definite plan based on a survey of all streets, highways, alleys and parks. From this survey the proper type of lighting for each classification can be determined. A progressive program should be adopted to take care of present requirements and provide for future additions as finances and other local conditions permit. Thus can be determined not only the need of each street, but the number and type of accidents and the crime experiences that may be laid to inadequate illumination. With such facts, the taxpayer will be informed on the costs and hazards of inadequate lighting installations. The municipal official will know where his street-lighting budget can be spent most effectively. The traffic engineer and illumination specialist realize full well that it is vain to hope that adequate illumination can be furnished immediately for all streets and highways; consequently they urge that studies be made and plans laid for progressively eliminating the dangerous streets and highways.

Street and highway lighting recommendations as now available in New Jersey can be drawn up in every state through the coordinated interest of local automobile clubs, insurance companies, motor-vehicle departments, safety councils, Governor's Committee on Safety, electrical manufacturers, engineers, chapters of the Illuminating Engineering Society, and lighting engineers of the electrical utility companies.

Planned street lighting, progressively installed as conditions warrant, and based on such trustworthy recommendations, assure every municipality greater safety, comfort and satisfaction, and lower economic losses. Such plans place the street-lighting equipment where most needed, not where greatest political pressure is placed for its installation. The adoption by ordinance of such plans in-

BENJAMIN
TRADE MARK

Specialized Lighting Equipment

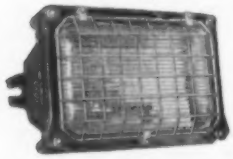
NRA WE DO OUR PART

Warning Signal Lighting Fixtures

Symmetrical Angle Reflector with Bull's Eye

Made with either symmetrical angle or elliptical angle porcelain enameled reflector and ruby lens for railroad crossings and viaducts. Combines highly efficient lighting with an effective warning signal light. Rugged and weather-resisting for severe service in exposed locations.

Underpass Lighting Fixtures



Underpass and Tunnel Lighting Fixture

Sturdy, weatherproof fixtures for the lighting of underpasses or tunnels. May be installed in wall or roof where the fixtures are out of line of vision and provide maximum clearance for passage of traffic.

Open-Type Floodlights

"Play-Area" Floodlight

Specially designed for floodlighting playgrounds, soft ball fields, athletic fields, tennis courts, swimming pools and other recreational areas. Equipped with Benjamin "Saflox" lowering attachment for easy cleaning and relamping on the ground.

Floodlighting Projectors

Enclosed Floodlight Projector

For floodlighting buildings, yards, monuments, large outdoor sport areas, etc. In a wide range of sizes and possessing every good feature required for this exacting service. Send for new Lighting Bulletin B-25.

Benjamin Electric Mfg. Co.

Des Plaines, Illinois

New York Chicago San Francisco

In direct line of vision but never in the way—

The MASTER TRAFFIC SIGNAL

Ever hear of accidents with those big traffic signs stuck square in the middle of the street?—Of course you have!

The MASTER traffic signal is also right out in front, where the signal should be, yet it is perfectly safe—never an obstruction to traffic, because when run over, it lies down flat to the pavement, springing back into position after the car has passed by.

Illustrated printed matter and prices sent on request. We have an interesting proposition for sales representation.

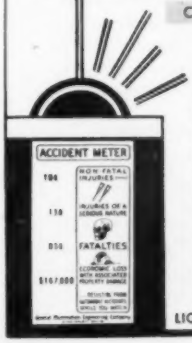
The picture shows the signal after it has been run over—after it has flipped back into position ready to warn the next comers.

SAGINAW-CORNELL TRACTOR CO.

Sole Distributors
Water and Bristol Streets
Saginaw, Mich.

GENERAL ILLUMINATION ENGINEERING CO.

Cincinnati, Ohio · · · · · · Carew Tower



NEEDLESS—

Over half of the night automobile accidents on city streets are needless. Yet they continue to increase the taxpayers' burden and consequently are one cause of delinquent taxes — all for want of a little additional street lighting. If your city's accident toll is increasing, rather than decreasing, may we refer you to our advertisement in the new 1935 Municipal Index where you can see how easy and economical it is to eliminate needless accident losses. General Illumination Engineering Company, Cincinnati, Ohio.

LIGHTING EXPERTS SELLING NOTHING BUT SERVICE

EverWear

PLAYGROUND APPARATUS
BEACH AND POOL EQUIPMENT

The standard of safety, the world over. A complete line of approved apparatus.

WRITE FOR CATALOG AND PRICES

The EverWear Manufacturing Co.
SPRINGFIELD, OHIO

sures that incoming administrations will continue on the program which has been found to be best in the long run. With such plans future conditions are foreseen, and after a period of years the system will be a coordinated and efficient unit. The greater concentration of illumination on the more hazardous streets and highways will visually prove to the taxpaying public that their officials are spending wisely, and returning benefits of safety and better business.

LIGHTING RECOMMENDATIONS FOR NEW JERSEY STREETS AND HIGHWAYS

Classifications	Lumens	Spacing Feet	Height Feet
Light traffic thoroughfares 400 vehicles per hour	4,000	150(st)	20
Light traffic intersections (2)	4,000		
Medium traffic thoroughfare 800 vehicles	10,000	150(st)	20–28
Medium traffic intersections (2)	10,000		
Heavy traffic thoroughfare more than 1,200 vehicles	10,000	150(op)	20–28
Heavy traffic intersections (4)	10,000		
Business streets (min.)	Same as medium traffic thoroughfare.		
Business streets (important)	same as heavy traffic thoroughfare.		
White ways	500 to 2,000 lumens per lineal foot.		
Residence streets (200 vehicles per hour)	2,500	150–250	18
Residence (less than 200 vehicles)	1,000	125	15
Residence (intersections)	4,000		20
Alleys	1,000	100–250	15
Park drives.	Same as thoroughfares		
Rural highways			
4,000-10,000 vehicles per day	6,000	250(st)	22–28
More than 10,000	10,000	250(op)	22–28

Mercury Vapor for Streets

EXPERIMENTAL lighting for a few blocks along 14th Street, Detroit, marks the first installation of mercury vapor on street series circuit. Nine 400-watt Westinghouse high-intensity lamps in enclosing globes are mounted on 22-foot poles staggered on 140-foot spacings. Regular illumination on this street is by 300-watt mazdas.

A Sodium Vapor Underpass

TWO sodium-vapor lamps in special G.E. reflectors have been installed at an underpass near Sacramento, and the amber caution color is expected to make the lighting doubly effective here.

ACTUAL APPLICATION OF THE LIGHTING PRINCIPLES EXPRESSED BY THE NEW JERSEY CODE

This is the dark bituminous macadam state highway that passes through the New Jersey town of Chatham—as it was, and as it now is after installing 6,000-lumen lamps spaced 200-250 feet at 23-foot heights on 8-16-foot mast arms, as recommended by the League of New Jersey Municipalities. The highway is actually arched over with trees

Voters judge your administration by the good it does

Bright Streets Help Cities Grow

Build Up Your Suburbs by Installing Street Lights

EXPERIENCE has shown that there is no better way to encourage building in your suburbs than by installing modern, attractive, street lighting. People like to live in a community that is growing — they prefer to build their homes on bright, cheerful streets.

An administration that improves the community wins the respect and loyal support of its citizens. Lighting will bring improvements — improvements that you can point to with pride. Good street lighting encourages building; it attracts business; it increases property values. In the prevention of night traffic accidents, alone, good lighting has proved to be an investment that saves nearly three times its cost*.

General Electric engineers have had long experience with street-lighting problems. Let them discuss with you the proper equipment to give economical, adequate lighting. Write to General Electric, Dept. 6D-201, Schenectady, N. Y., for any information on Novalux street-lighting equipment.

** You pay for good street lighting whether you have it or not*

500-123

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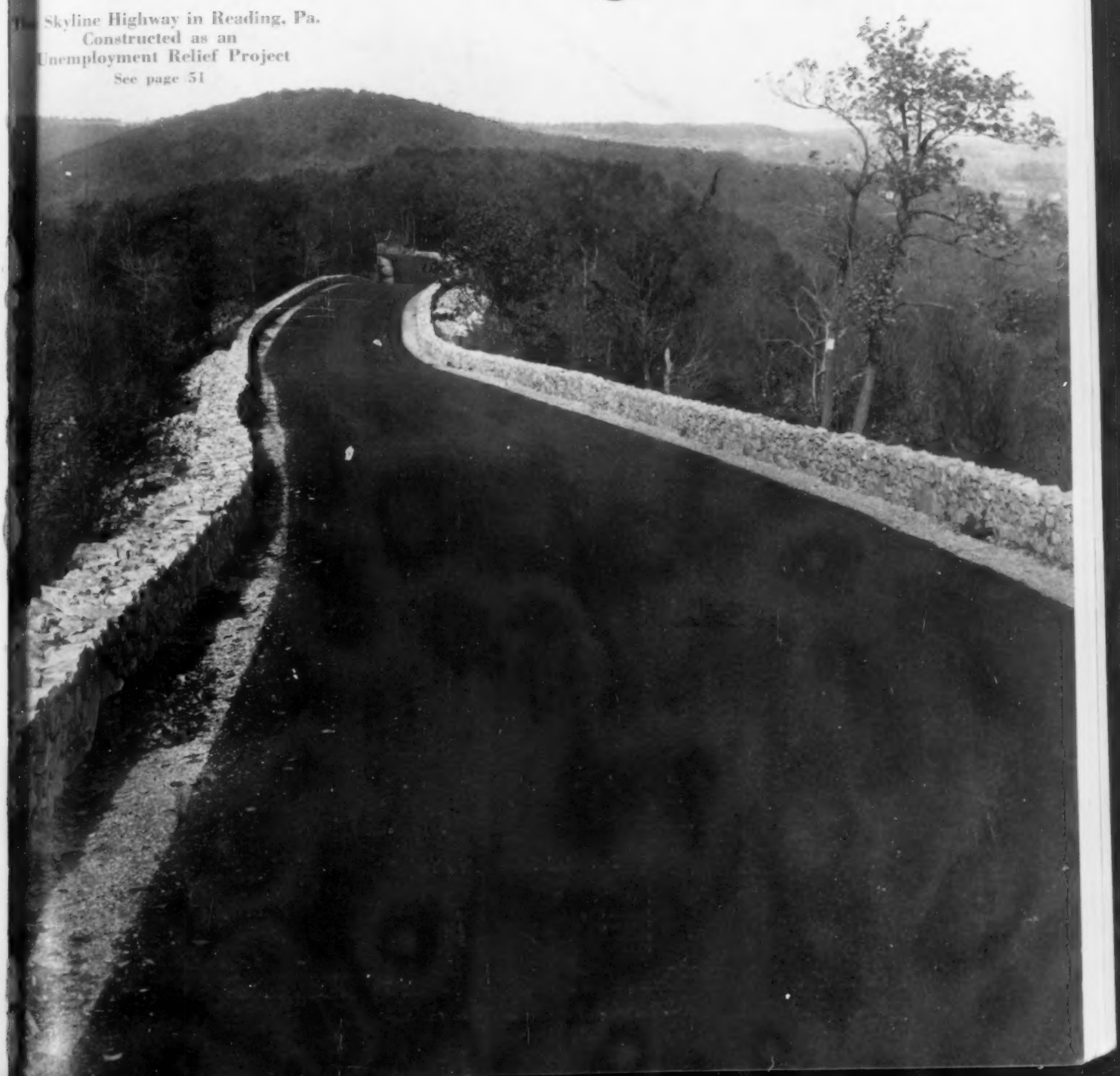
The American City

Skyline Highway in Reading, Pa.
Constructed as an
Unemployment Relief Project
See page 51